

**GLENCOE
MATHEMATICS**

Grade 8

North Carolina End-of-Grade (EOG) Test

Practice and Sample Test Workbook

Includes:

- **Grade 8 North Carolina Course of Study Content Standards**
- **Diagnostic Test**
- **Numerous Practice Questions for Each Content Standard**
- **Full-Size Sample Test**
- **Student Recording Chart**

Test-Taking Tips

- Go to bed early the night before the test. You will think more clearly after a good night's rest.
- Read each problem carefully and think about ways to solve the problem before you try to answer the question.
- Relax. Most people get nervous when taking a test. It's natural. Just do your best.
- Answer questions you are sure about first. If you do not know the answer to a question, skip it and go back to that question later.
- Think positively. Some problems may seem hard to you, but you may be able to figure out what to do if you read each question carefully.
- If no figure is provided, draw one. If one is furnished, mark it up to help you solve the problem.
- When you have finished each problem, reread it to make sure your answer is reasonable.
- Become familiar with a variety of formulas and when they should be used.
- Make sure that the number of the question on the answer sheet matches the number of the question on which you are working in your test booklet.

Consultant

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Glencoe

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*North Carolina EOG Test
Practice and Sample Test Workbook, Grade 8*

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Overview

The material in this booklet is designed to help you prepare for the Grade 8 North Carolina End-of-Grade (EOG) Test.

It contains:

- a Student Recording Chart,
- the 1998 Standard Course of Study for Grade 8,
- a Diagnostic Test,
- practice for each Content Standard, and
- a Sample Test.

How to Use the Booklet

Diagnostic Test This test will help you identify any weaknesses you may have as you prepare to take the Grade 8 EOG Test. Once you've taken the test and it's been graded, complete the Student Recording Chart that is found on page v. Mark an \times in the square for each question that you answered *incorrectly*.

Practice If you missed one or two of the questions for a particular content standard, you could probably use some extra practice with that content standard. The Student Recording Chart lists practice pages for each content standard. Complete the appropriate practice pages. If you are unsure about how to do some of the problems, you may want to refer to your mathematics book.

Sample Test After you have completed your practice worksheets, take the Sample Test on pages 87 to 102.

Student Recording Chart

Directions Mark an \times by each question from the Diagnostic Test that you answered *incorrectly*. If there are one or two \times s marked for a standard, write *Yes* in the *Need Practice?* box. Then complete the practice pages for that standard.

Competency Goal 1: Number Sense, Numeration, and Numerical Operations												
Standard	2.01	2.02	2.03	2.04	2.05	2.06	2.07	2.08	2.09	2.10	2.11	2.12
Test Questions	1 <input type="checkbox"/>	25 <input type="checkbox"/>	30 <input type="checkbox"/>	31 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	34 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	29 <input type="checkbox"/>
	12 <input type="checkbox"/>	40 <input type="checkbox"/>	45 <input type="checkbox"/>	77 <input type="checkbox"/>	13 <input type="checkbox"/>	14 <input type="checkbox"/>	51 <input type="checkbox"/>	15 <input type="checkbox"/>	16 <input type="checkbox"/>	17 <input type="checkbox"/>	18 <input type="checkbox"/>	41 <input type="checkbox"/>
	23 <input type="checkbox"/>	75 <input type="checkbox"/>	76 <input type="checkbox"/>				78 <input type="checkbox"/>		24 <input type="checkbox"/>			79 <input type="checkbox"/>
Need Practice?												
Practice Pages	17	19	21	23	25	27	29	31	33	35	37	39
	18	20	22	24	26	28	30	32	34	36	38	40

Competency Goal 2: Spatial Sense, Measurement, and Geometry												
Standard	2.01	2.02	2.03	2.04	2.05	2.06	2.07	2.08	2.09	2.10	2.11	2.12
Test Questions	35 <input type="checkbox"/>	47 <input type="checkbox"/>	26 <input type="checkbox"/>	57 <input type="checkbox"/>	36 <input type="checkbox"/>	28 <input type="checkbox"/>	32 <input type="checkbox"/>	38 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>	10 <input type="checkbox"/>	11 <input type="checkbox"/>
	46 <input type="checkbox"/>	70 <input type="checkbox"/>	56 <input type="checkbox"/>	71 <input type="checkbox"/>	60 <input type="checkbox"/>	61 <input type="checkbox"/>	73 <input type="checkbox"/>	67 <input type="checkbox"/>	19 <input type="checkbox"/>		21 <input type="checkbox"/>	22 <input type="checkbox"/>
	80 <input type="checkbox"/>		65 <input type="checkbox"/>			68 <input type="checkbox"/>	74 <input type="checkbox"/>		20 <input type="checkbox"/>			
Need Practice?												
Practice Pages	41	43	45	47	49	51	53	55	57	59	61	63
	42	44	46	48	50	52	54	56	58	60	62	64

Competency Goal 3: Patterns, Relationships, and Functions					
Standard	3.01	3.02	3.03	3.04	3.05
Test Questions	42 <input type="checkbox"/> 52 <input type="checkbox"/>	27 <input type="checkbox"/> 63 <input type="checkbox"/>	48 <input type="checkbox"/> 59 <input type="checkbox"/>	50 <input type="checkbox"/> 55 <input type="checkbox"/>	43 <input type="checkbox"/> 54 <input type="checkbox"/>
Need Practice?					
Practice Pages	65, 66	67, 68	69, 70	71, 72	73, 74

Competency Goal 4: Data, Probability, and Statistics						
Standard	4.01	4.02	4.03	4.04	4.05	4.06
Test Questions	39 <input type="checkbox"/> 66 <input type="checkbox"/>	33 <input type="checkbox"/> 64 <input type="checkbox"/>	49 <input type="checkbox"/> 69 <input type="checkbox"/>	53 <input type="checkbox"/> 62 <input type="checkbox"/>	44 <input type="checkbox"/> 72 <input type="checkbox"/>	37 <input type="checkbox"/> 58 <input type="checkbox"/>
Need Practice?						
Practice Pages	75, 76	77, 78	79, 80	81, 82	83, 84	85, 86

North Carolina 1998 Standard Course of Study Grade 8

Competency Goals and Objectives	
COMPETENCY GOAL 1: Number Sense, Numeration, and Numerical Operations	
1.01	Identify subsets of the real number system.
1.02	Estimate and compute with rational numbers.
1.03	Compare, order, and convert among fractions, decimals (terminating and non-terminating), and percents.
1.04	Solve problems involving percent of increase and percent of decrease.
1.05	Use scientific notation to express large numbers and numbers less than one. Write in standard form numbers given in scientific notation.
1.06	Use rules of exponents.
1.07	Estimate the square root of a number between two consecutive integers; using a calculator, find the square root of a number to the nearest tenth.
1.08	Solve problems involving exponents and scientific notation.
1.09	Determine the absolute value of a number.
1.10	Identify, explain, and apply the commutative, associative, and distributive properties, inverses, and identities in algebraic expressions.
1.11	Simplify algebraic expressions.
1.12	Analyze problems to determine if there is sufficient or extraneous data, select appropriate strategies, and use an organized approach to solve using calculators when appropriate.
COMPETENCY GOAL 2: Spatial Sense, Measurement, and Geometry	
2.01	Use geometric concepts and modeling to interpret and solve problems.
2.02	Calculate distances and areas from scale drawings and maps.
2.03	Find the surface area of rectangular solids and cylinders.
2.04	Use models to investigate the relationship of the volume of a cone to a cylinder and a pyramid to a prism with the same base and height.
2.05	Find the volume of prisms, cylinders, pyramids, and cones, with and without models.
2.06	Use the Pythagorean Theorem to solve problems.
2.07	Determine the effect on the volume of solid figures when one or more dimension is changed.
2.08	Solve problems related to similar and congruent figures.
2.09	Locate, give the coordinates of and graph plane figures which are the results of rotations (multiples of 90 degrees). Graph plane figures which are similar to a given figure (dilations.)

Competency Goals and Objectives

2.10 Identify and draw 3-dimensional figures from different perspectives (top, side, front, corner); use appropriate technology.

2.11 Build 3-dimensional figures given various views.

2.12 Select appropriate units and tools for measurement tasks within problem-solving situations; determine precision and check for reasonableness of results.

COMPETENCY GOAL 3: Patterns, Relationships, and Functions

3.01 Use formulas in problem-solving situations.

3.02 Solve one and two-step linear equations and inequalities.

3.03 Graph a linear equation using ordered pairs. Investigate the graphs of linear inequalities; use appropriate technology.

3.04 Investigate the concept of slope; use appropriate technology.

3.05 Describe, extend, and analyze a wide variety of geometric and numerical patterns, such as Pascal's triangle or the Fibonacci sequence; use appropriate technology.

COMPETENCY GOAL 4: Data, Probability, and Statistics

4.01 Interpret and construct box plots.

4.02 Collect data involving two variables and display on a scatter plot; interpret results; identify positive and negative relationships.

4.03 Interpret the mean, explain its sensitivity to extremes, and explain its use in comparison with the median and the mode.

4.04 Evaluate arguments based on data. Discuss random vs. biased sampling.

4.05 Find the probability of independent and dependent events.

4.06 Make predictions based on theoretical probabilities and experimental results.

Diagnostic Test

Test Practice



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 What kind of number will you obtain any time you divide an integer by 6? **1** _____
- A** whole number **1.01**
B integer
C rational number
D irrational number
- 2 Jupiter is the largest planet in the solar system and is about 483.6 million miles from the sun. How is this distance written in scientific notation? **2** _____
- A** 483.6×10^6 mi **1.05**
B 483.6×10^3 mi
C 48.36×10^7 mi
D 4.836×10^8 mi
- 3 Write $\frac{120m^2n^{-3}}{60m^5n^{-2}}$ in simplest form using only positive exponents. Assume that $m \neq 0$ and $n \neq 0$. **3** _____
- A** $\frac{2n}{m^3}$
B $\frac{2}{m^3n}$
C $\frac{2m^3}{n}$
D $\frac{1}{2m^3n}$
- 4 It takes light about 8.32 minutes to travel from the sun to Earth. The distance from the sun to Earth is about 1.496×10^8 kilometers. The distance from the sun to the planet Saturn is about 1.427×10^9 kilometers. About how many minutes does it take light to travel from the sun to Saturn? Answer to the nearest minute. **4** _____
- A** 79 min
B 101 min
C 105 min
D 159 min
- 5 What is the value of $|12 - 58|$? **5** _____
- A** 70
B 60
C 50
D 46



Diagnostic Test (continued)

Test Practice



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 6 The decimal for a certain number is neither a terminating decimal nor a repeating decimal. What kind of number is it? **1.01**

A irrational number **B** rational number
C negative integer **D** whole number

6 _____

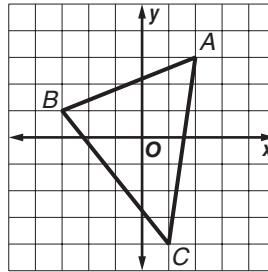
- 7 A cash register contains x nickels, y dimes, and $2x$ quarters. Another cash register contains x pennies, y nickels, y dimes, and $x - 1$ quarters. What is the total value, in cents, of the coins in both cash registers? **1.11**

A $5x + 3y - 1$ **B** $81x + 25y - 1$
C $81x + 25y - 25$ **D** $80x + 24y - 25$

7 _____

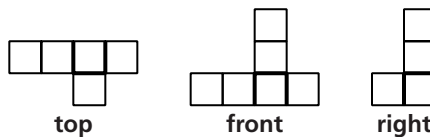
- 8 What are the coordinates of the image of vertex C of $\triangle ABC$ when $\triangle ABC$ is rotated 90° counterclockwise around the origin? **2.09**

A (4, 1)
B (1, 4)
C (-4, 1)
D (-1, 4)

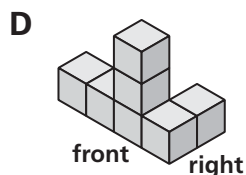
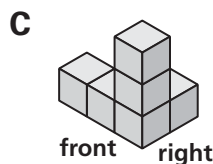
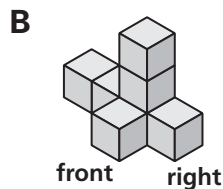
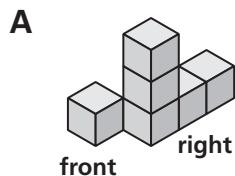


8 _____

- 9 Which solid figure could have the top, front, and right views shown at the right? **2.10**

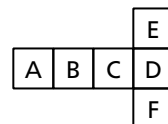


9 _____



- 10 If you cut out and fold the pattern shown at the right to make a cube, which letter will be on the face of the cube opposite the face labeled C ? **2.11**

A A **B** D
C E **D** F



10 _____



Diagnostic Test (continued)

Test Practice



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 11** Courtney is using a map of North Carolina to find the approximate distance from Asheville to Winston-Salem. She uses a ruler for which the closest marks are $\frac{1}{4}$ inch apart and measures the map distance between the cities as $3\frac{1}{4}$ inches. The scale for the map is 1 inch = 40 miles. What is the greatest possible error in the distance she calculates? **2.12** **11** _____
- A** 20 mi
B 15 mi
C 10 mi
D 5 mi
- 12** Which property do you use when you combine two or more like terms to get a single term? **1.10** **12** _____
- A** Distributive Property
B Associative Property of Addition
C Commutative Property of Addition
D Identity Property of Multiplication
- 13** Carbon dioxide makes up, by volume, about 0.00031 of Earth's atmosphere. How is this number written in scientific notation? **1.05** **13** _____
- A** 3.1×10^{-6}
B 3.1×10^{-5}
C 3.1×10^{-4}
D 3.1×10^{-3}
- 14** Simplify $(2ab^4)^5$. **1.06** **14** _____
- A** $2ab^9$
B $2ab^{20}$
C $10a^5b^{20}$
D $32a^5b^{20}$
- 15** The estimated population of North Carolina in 2002 was 8.32×10^6 . The total area of the state, including water, is about 5.38×10^4 square miles. About how many people per square mile did North Carolina have in 2002? Express the answer in scientific notation. **1.08** **15** _____
- A** 1.55×10^2
B 1.55×10^3
C 0.0065×10^{-2}
D 0.0065×10^{-3}

Go on

Diagnostic Test (continued)

Test Practice



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

16 Which equation is true? 1.09

A $\frac{-5}{|-5|} = 1$

B $\frac{-5}{|-5|} = -1$

C $\left| \frac{-5}{5} \right| = -\left| \frac{5}{-5} \right|$

D $\left| \frac{-5}{-5} \right| = -1$

16 _____

17 Which property would be most helpful in computing $(93 \cdot 40) \cdot 25$ mentally? 1.10

A Commutative Property of Multiplication

B Associative Property of Multiplication

C Inverse Property of Multiplication

D Distributive Property

17 _____

18 Simplify $-3(8 + 4k) + 7(3k - 2)$. 1.11

A $9k - 38$

B $25k - 38$

C $25k - 26$

D $9k - 26$

18 _____

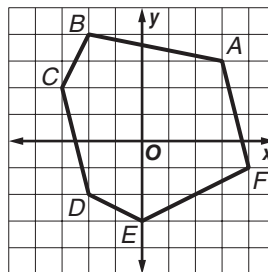
19 What are the coordinates of the image of vertex B when polygon $ABCDEF$ is rotated 180° clockwise around the origin? 2.09

A $(2, 4)$

B $(4, -2)$

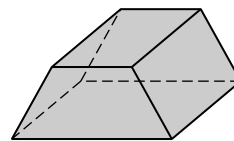
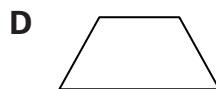
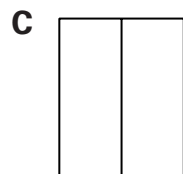
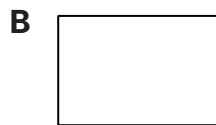
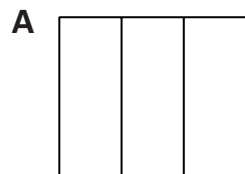
C $(2, -4)$

D $(-4, 2)$



19 _____

20 What is the top view of the prism? 2.09

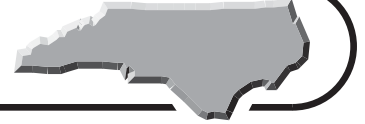


20 _____

Go on

Diagnostic Test (continued)

Test Practice

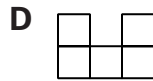
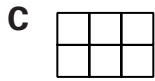
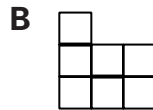
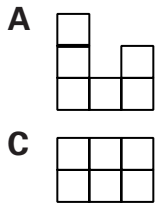


Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 21 A plan for a figure that will be built from cubes is shown at the right. The numbers in the squares indicate how many cubes are to be stacked in each location. What front view will you see after building the figure? **2.11**

3	1	2
2	2	2
2	1	2

front



21 _____

- 22 Sabrina's new wristwatch has marks that are spaced 5 minutes apart, but no marks for individual minutes. What is the greatest possible error when she uses her watch to tell the time? **2.12**

A 5 min
C 1 min

B 2.5 min
D 0.5 min

22 _____

- 23 Which number is a rational number? **1.01**

A $\sqrt{109}$
C $\sqrt{149}$

B $\sqrt{116}$
D $\sqrt{169}$

23 _____

- 24 If $|x| = 2$, $|y| = 4$, and $|z| = 6$, what is a possible value of $x + y + z$? **1.09**

A 6
C -12

B 2
D -14

24 _____

- 25 Last year Mr. Jackson earned \$5,800 from the corn he grew on his farm in North Carolina. This year he expects a 7% increase in the income from corn. How much does he expect to earn on corn this year? **1.02**

A \$406
C \$8,660

B \$6,206
D \$9,660

25 _____

- 26 An oatmeal carton is a cardboard cylinder with a radius of 3.75 inches and a height of 9 inches. To the nearest square inch, how much cardboard is used for the carton? **2.03**

A 212 in²
C 300 in²

B 256 in²
D 468 in²

26 _____



Diagnostic Test (continued)

Test Practice



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

27 Solve $-12x \geq 34$. **3.02**

A $x \geq -2\frac{5}{6}$

B $x \leq -2\frac{5}{6}$

C $x \geq -\frac{6}{17}$

D $x \leq -\frac{6}{17}$

27 _____

28 A water slide drops 120 feet over a horizontal distance of 160 feet, as shown in the figure.

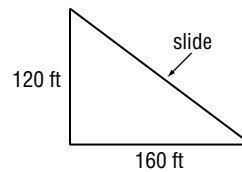
How long is the slide? **2.06**

A 200 ft

B 280 ft

C 300 ft

D 350 ft



28 _____

29 A salesperson earns a 4% commission on sales of new computers. The state sales tax is 5%. If the salesperson makes computer sales of \$8,700, what is the commission? **1.12**

A \$34.80

B \$348.00

C \$435.00

D \$783.00

29 _____

30 The population of North Carolina in 2001 was about 8.2 million, and the population of the United States was about 284.8 million. North Carolina made up about what percent of the population of the United States in 2001? **1.03**

A 32%

B 29%

C 3.2%

D 2.9%

30 _____

31 Carlos made \$750 last year at a part-time summer job. This summer he earned \$925. What was the percent increase in his summer earnings from last year to this year? **1.04**

A $23\frac{1}{3}\%$

B $36\frac{2}{3}\%$

C $230\frac{1}{3}\%$

D $360\frac{2}{3}\%$

31 _____

32 A company sells rectangular packing boxes. Their smallest box has a volume of 2.5 cubic feet. Their largest box has dimensions that are twice the dimensions of the smallest box. What is the volume of the largest box? **2.07**

A 20 ft^3

B 15 ft^3

C 10 ft^3

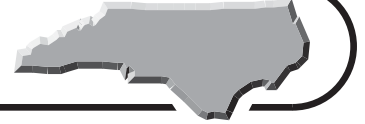
D 5 ft^3

32 _____



Diagnostic Test (continued)

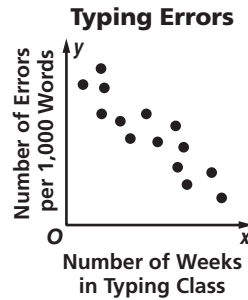
Test Practice



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 33** What kind of correlation is shown by the scatter plot at the right? **4.02**

A positive
B negative
C indirect
D no correlation



33 _____

- 34** What is the value of $\sqrt{40}$ to the nearest tenth? **1.07**

A 20.0 **B** 16.0 **C** 6.6 **D** 6.3

34 _____

- 35** Which are the lengths of the sides of a triangle that has a perimeter of 24 centimeters? **2.01**

A 6 cm, 6 cm, 12 cm
B 7 cm, 7 cm, 10 cm
C 3 cm, 8 cm, 13 cm
D 4 cm, 5 cm, 15 cm

35 _____

- 36** A cylindrical soup can has a diameter of 3 inches and a height of 3.7 inches. What is the volume of the can? Use 3.14 for π . Answer to the nearest tenth of a cubic inch. **2.05**

A 7.1 in^3 **B** 9.4 in^3 **C** 26.1 in^3 **D** 34.9 in^3

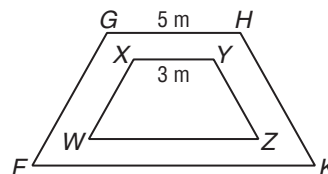
36 _____

- 37** If you toss a pair of number cubes, the probability of getting a sum of 3 is $\frac{1}{18}$. If you toss the cubes 90 times, how many times would you expect to get a sum of 3? **4.06**

A 8 **B** 7 **C** 6 **D** 5

37 _____

- 38** A large flower bed is being planned for a city park. Inside the large flower bed $FGHK$ there will be a similar smaller bed $WXYZ$, as shown at the right. Each flower bed will have a low fence around it. If the perimeter of the large bed is 27 meters, how much fencing in all will be needed? **2.08**



38 _____

A 54 m **B** 43.2 m **C** 41.2 m **D** 32.4 m



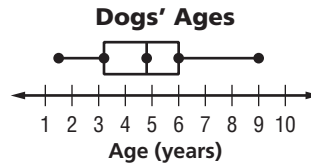
Diagnostic Test (continued)

Test Practice



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 39** The box-and-whisker plot shows information about the ages of the dogs that are pets of students at a school in Chapel Hill. What is the median age of the dogs? **4.01**



39 _____

- A** 3.2 yr **B** 4.8 yr **C** 6 yr **D** 9 yr

- 40** Ambria bought 4 pounds of fish for \$12.45. Her cousin bought the same kind of fish and paid \$25.10. Estimate the number of pounds of fish her cousin bought. **1.02**

40 _____

- A** 12 lb **B** 10 lb **C** 9 lb **D** 8 lb

- 41** Ken bought remodeling supplies at a lumberyard. Of the \$500 that he spent, 32% was for wood, 26% was for tools, 2% was for nails, and 40% was for flooring. How much money did he spend for wood and flooring?

41 _____

- A** \$160 **B** \$200 **C** \$360 **D** \$370 **1.12**

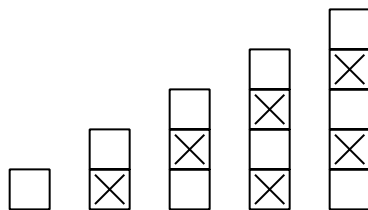
- 42** You can use the formula $V = 331.4 + 0.6T$ to find the speed of sound in air V , in meters per second, when the air temperature is T degrees Celsius. What is the velocity of sound in air on a day when the temperature is 31°C ? **3.01**

42 _____

- A** 350 m/s **B** 345 m/s **C** 340 m/s **D** 330 m/s

- 43** Which is the next figure for the pattern shown below? **3.05**

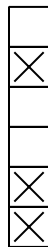
43 _____



A



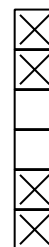
B



C

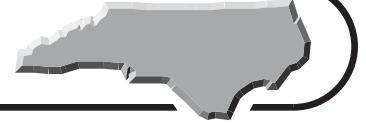


D



Diagnostic Test (continued)

Test Practice



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

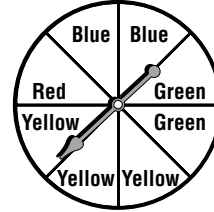
- 44** If you spin the spinner twice, what is the probability of getting yellow both times? **4.05**

A $\frac{9}{64}$

B $\frac{3}{32}$

C $\frac{5}{64}$

D $\frac{1}{16}$



44 _____

- 45** Which number is greatest? **1.03**

A $3.\overline{789}$

B $3.\overline{789}$

C $3.\overline{789}$

D $3.\overline{789}$

45 _____

- 46** Charlene has 24 yards of fencing to use for a pen for her pet rabbit. The sections of fencing come in sections that are 1 yard long. What is the greatest area she can enclose with the fencing that she has? **2.01**

A 24 yd^2

B 32 yd^2

C 36 yd^2

D 48 yd^2

46 _____

- 47** Abdul printed out a map of North Carolina that he found on the Internet. He lives in Caswell County. When he measured the county on the map, he found that it seemed to be a square with sides 1 centimeter long. Information that came with the map said that the area of Caswell county is 426 square miles. If the map is reasonably accurate, approximately what scale does the map use? **2.02**

A $1 \text{ cm} = 17 \text{ mi}$

B $1 \text{ cm} = 18 \text{ mi}$

C $1 \text{ cm} = 19 \text{ mi}$

D $1 \text{ cm} = 21 \text{ mi}$

47 _____

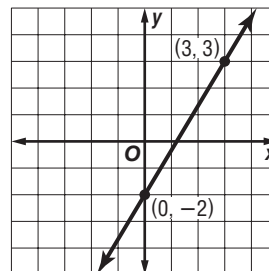
- 48** Which equation has the graph shown at the right? **3.03**

A $y = \frac{5}{3}x + 2$

B $y = \frac{8}{3}x - 2$

C $y = \frac{5}{3}x - 2$

D $y = \frac{4}{3}x - 2$



48 _____

Go on

Diagnostic Test (continued)

Test Practice



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

49 Which measure for a set of data is usually *most* affected by a data value that is much greater than all the other data values? **4.03** **49** _____

- A** median
B mode
C first quartile
D mean

50 Which equation has a graph that is parallel to the graph of $y = -4x + 7$? **3.04** **50** _____

- A** $8x + 2y = 19$
B $5x - 3y = 7$
C $6x - 4y = 8$
D $16x - 8y = 5$

51 Between which two whole numbers is $\sqrt{390}$? **1.07** **51** _____

- A** 17 and 18
B 18 and 19
C 19 and 20
D 20 and 21

52 The formula $A = \frac{1}{2}ab$ can be used to find the area of a rhombus that has diagonals of lengths a and b . What is the area of a rhombus that has diagonals of lengths 8 centimeters and 11 centimeters? **3.01** **52** _____

- A** 88 cm^2
B 52 cm^2
C 44 cm^2
D 40 cm^2

53 You are going to use a sample of students at your school for a survey. If each student has the same chance of being selected for the sample, what kind of sample will you have? **4.04** **53** _____

- A** biased sample
B majority sample
C minority sample
D random sample

54 Which equation describes how the values of x and y are related for the table shown at the right? **3.05** **54** _____

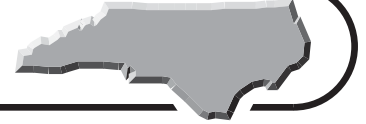
- A** $y = 2x + 7$
B $y = -2x + 7$
C $y = 2x + 6$
D $y = -8x + 1$

x	y
-1	9
0	7
1	5
2	3



Diagnostic Test (continued)

Test Practice



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 55** What is the slope of the line that passes through the points with coordinates (5, 8) and (-3, 4)? **3.04**

A $\frac{1}{2}$

B $\frac{1}{3}$

C $-\frac{3}{7}$

D $-\frac{1}{2}$

55 _____

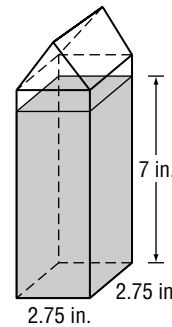
- 56** An orange juice carton has the dimensions shown in the figure at the right. If the carton is filled with juice to a height of 7 inches, what is the volume of the juice in the carton? Answer to the nearest tenth of a cubic inch. **2.03**

A 134.8 in³

B 52.9 in³

C 20.8 in³

D 19.3 in³



56 _____

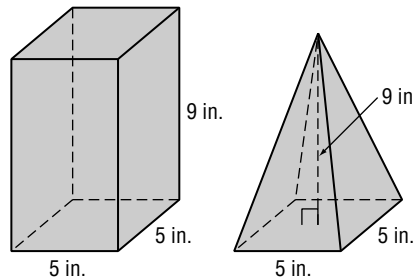
- 57** The rectangular prism and the pyramid have the same height and their bases are squares. How many times greater is the volume of the prism than the volume of the pyramid? **2.04**

A $1\frac{1}{2}$ times

B 2 times

C 3 times

D 4 times



57 _____

- 58** The probability of getting a sum of 7 when you toss two number cubes is $\frac{1}{6}$. If you toss two number cubes 120 times, about how many tosses would you expect to result in a sum of 7? **4.06**

A 20

B 25

C 30

D 35

58 _____

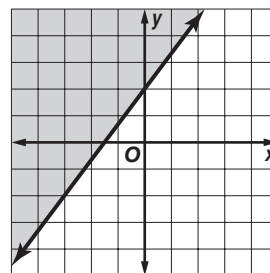
- 59** The graph at the right is the graph of which inequality? **3.03**

A $y < \frac{4}{3}x + 2$

B $y \leq \frac{4}{3}x + 2$

C $y \geq \frac{4}{3}x + 2$

D $y > \frac{4}{3}x + 2$



59 _____

Go on

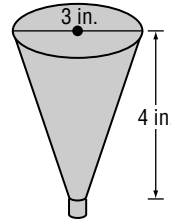
Diagnostic Test (continued)

Test Practice



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

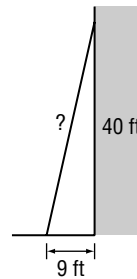
- 60** A funnel can be modeled by a cone that has a diameter of 3 inches at the large end and a height of 4 inches. What is the volume of this part of the funnel? Use 3.14 for π . Round the volume to the nearest tenth of a cubic inch. **2.05**



60 _____

- A 8.3 in^3
- B 9.4 in^3
- C 12.6 in^3
- D 28.3 in^3

- 61** The top end of a ladder that is propped against a wall is 40 feet above ground level. The foot of the ladder is 9 feet from the wall. How long is the ladder? **2.06**



61 _____

- A 50 ft
- B 49 ft
- C 44 ft
- D 41 ft

- 62** A magazine article stated that the average American male is 5 feet $9\frac{1}{2}$ inches tall, weighs 172 pounds, has a shoe size of $9\frac{1}{2}$, and sleeps 7.7 hours a day. To evaluate this statement, which question would be most important to answer? **4.04**

62 _____

- A Did the person who wrote the magazine article have a college degree?
- B Is the average American male married or unmarried?
- C On what data was the article based and how were the data obtained?
- D How widely read is the magazine in which the article appeared?

- 63** What is the solution of $-12x = 156$? **3.02**

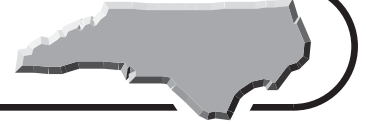
63 _____

- A 18
- B $-\frac{1}{13}$
- C -12
- D -13



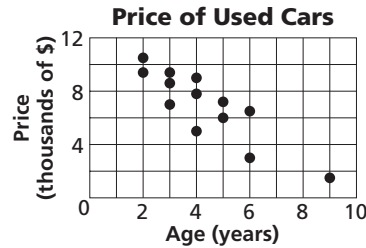
Diagnostic Test (continued)

Test Practice



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 64** The scatter plot at the right shows information about the age and price of thirteen used cars. Which conclusion is most reasonable? **4.02**



64 _____

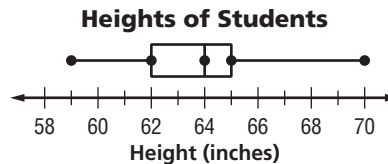
- A** There is no demand for used cars less than 2 years old.
- B** There is no relationship between the manufacturer and the price of a used car.
- C** The older a car is, the lower its price tends to be.
- D** There is no demand for used cars that are more than 9 years old

- 65** A rectangular gift box is 12 inches long, 5 inches wide, and $4\frac{1}{2}$ inches tall. What area must be covered to wrap the box? **2.03**

65 _____

- A** 120 in^2
- B** 153 in^2
- C** 196 in^2
- D** 273 in^2

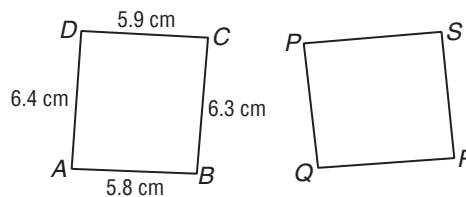
- 66** The box-and-whisker plot shows information about the heights of students in a high school English class. What is a reasonable statement based on the plot? **4.01**



66 _____

- A** Half the students were less than 64 inches tall.
- B** Half the students were more than 64 inches tall.
- C** No one in the class was 6 feet tall or taller.
- D** The class has fewer short students than tall students.

- 67** If polygon $ABCD \cong$ polygon $PQRS$, what is the length of \overline{RS} ? **2.08**



67 _____

- A** 5.8 cm
- B** 5.9 cm
- C** 6.3 cm
- D** 6.4 cm



Diagnostic Test (continued)

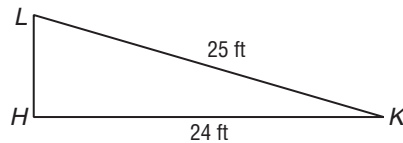
Test Practice



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 68** What is the length of \overline{HL} in right triangle HKL ? **2.06**

A 7 ft
B 8 ft
C 9 ft
D 10 ft



68 _____

- 69** Mr. Snowden gave a science test, and the mean score was 82. Two students who were home sick on the day of the test took a make-up test. The first of these students scored 75 on the make-up test. After the second student took a make-up test, the mean for the entire class was still 82. What did the second student score? **4.03**

A 92
B 90
C 89
D 87

69 _____

- 70** The distance between two cities on a map is $2\frac{3}{4}$ inches. If the scale for the map is 1 inch = 15 miles, what is the actual distance between the cities? Round to the nearest mile. **2.02**

A 52 mi
B 48 mi
C 43 mi
D 41 mi

70 _____

- 71** The volume of a cone is 72 cubic centimeters. A cylinder has a base that is the same size as the base of the cone, and the heights of the cone and cylinder are equal. What is the volume of the cylinder? **2.04**

A 48 cm^3
B 108 cm^3
C 216 cm^3
D 252 cm^3

71 _____

- 72** A standard deck of cards contains 52 cards of which 26 are black and 26 are red. Suppose you draw a card from the deck, do not replace it, and then draw a second card. What is the probability that both of the cards you drew are black? **4.05**

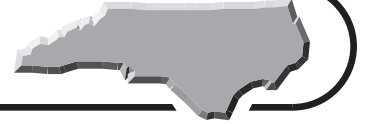
A $\frac{25}{51}$
B $\frac{1}{4}$
C $\frac{25}{102}$
D $\frac{1}{5}$

72 _____



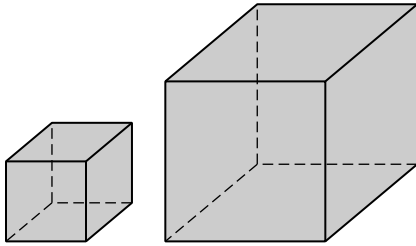
Diagnostic Test (continued)

Test Practice



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

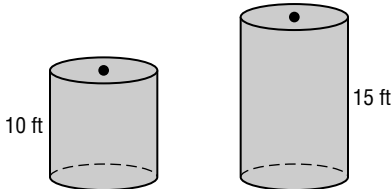
- 73** You are buying boxes for storing old clothes. The boxes are rectangular, and the large boxes have dimensions that are double those of the small boxes. How many times greater is the volume of a large box than the volume of a small box? **2.07**



- A** 2 times **B** 4 times
C 8 times **D** 16 times

73 _____

- 74** Two cylindrical water tanks have bases that are the same size. The height of the larger tank is 15 feet, and the height of the smaller tank is 10 feet. How many times greater is the volume of the larger tank than that of the smaller tank? **2.07**



- A** $1\frac{1}{2}$ **B** 2
C $2\frac{1}{2}$ **D** 3

74 _____

- 75** What is the value of $2\frac{1}{4} \cdot (3\frac{1}{2} + 5\frac{5}{6})$? **1.02**

- A** $11\frac{7}{12}$ **B** $13\frac{17}{24}$
C 18 **D** 21

75 _____

- 76** What is $0.08\bar{3}$ written as a percent? **1.03**

- A** $\frac{8}{3}\%$ **B** $8\frac{1}{30}\%$
C 8.3% **D** $8\frac{1}{3}\%$

76 _____



Diagnostic Test (continued)

Test Practice



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 77** The table shows the number of eighth graders in four North Carolina schools last year and this year. Which school had the greatest percent increase in its eighth grade enrollment? **1.04**

77 _____

School	Eighth Graders Last Year	Eighth Graders This Year
A	163	169
B	125	130
C	140	145
D	152	156

- A** school A
B school B
C school C
D school D

- 78** $\sqrt{500}$ is between which two consecutive integers? **1.07**

78 _____

- A** 22 and 23
B 21 and 22
C 20 and 21
D 19 and 20

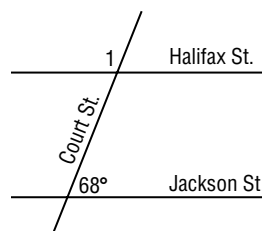
- 79** Alex estimates it would take him 60 hours to paint Mr. Simpson's house. Jaime estimates he could do the job in 40 hours. If their estimates are accurate, how long would the job take if they work together? **1.12**

79 _____

- A** 24 h
B 28 h
C 30 h
D 50 h

- 80** Court Street intersects Halifax Street and Jackson Street, as shown in the figure. Halifax Street and Jackson Street are parallel. What is the measure of angle 1? **2.01**

80 _____

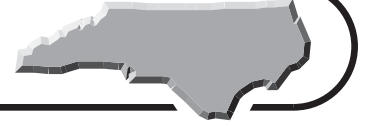


- A** 22
B 112
C 180
D 248



Standards Practice

Objective 1.01



Identify subsets of the real number system.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 In the game of golf, scores are given as the number of strokes above or below par, where par is the expected score. If you are at par, your score is zero. Saturday you and three friends played a round of golf and had the scores shown at the right. These scores belong to which set of numbers?

Player	Score
Fredia	6
You	0
Rita	-2
Ben	-12

1 _____

- A irrational numbers
 B whole numbers
 C integers
 D counting numbers

- 2 Tito crossed the finish line in a race 2.5 seconds before Milton. Which set of numbers contains the number 2.5?

2 _____

- A irrational numbers
 B rational numbers
 C integers
 D whole numbers

- 3 The numbers $\sqrt{5}$, $-\sqrt{22}$, and π are examples of what kind of number?

3 _____

- A whole numbers
 B integers
 C counting numbers
 D irrational numbers

- 4 In a recent year, North Carolina exported \$17.9 billion worth of goods throughout the world. The table shows the top five countries that received North Carolina exports that year and the value of goods received. Which sets of numbers contain all these values?

Country	Value of Goods (billions of \$)
Canada	4.9
Mexico	1.98
Japan	1.54
United Kingdom	1.2
Germany	0.767

4 _____

- A irrational numbers only
 B rational numbers only
 C irrational numbers, rational numbers, and integers
 D whole numbers, integers, and rational numbers

Standards Practice

Objective 1.01 (continued)



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

5 Which number is an irrational number?

A $-\sqrt{81}$

B $\sqrt{49}$

C $\sqrt{90}$

D $\sqrt{144}$

5 _____

6 Which number is a rational number?

A $\sqrt{8}$

B $\sqrt{12}$

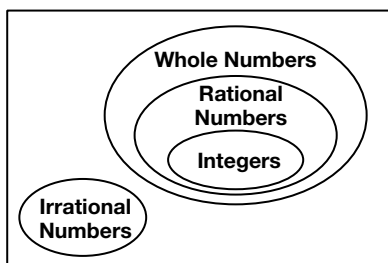
C $\sqrt{\frac{2}{3}}$

D $\sqrt{\frac{4}{9}}$

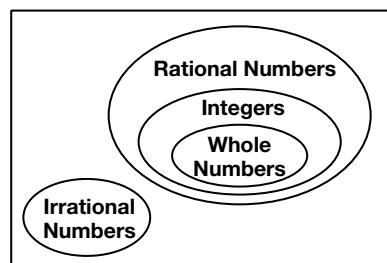
6 _____

7 Which diagram best shows how the sets of whole numbers, integers, rational numbers, and irrational numbers are related?

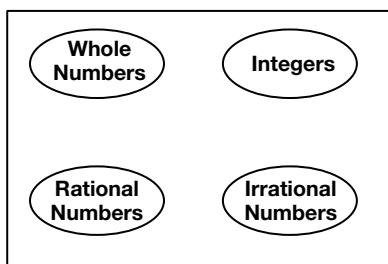
A



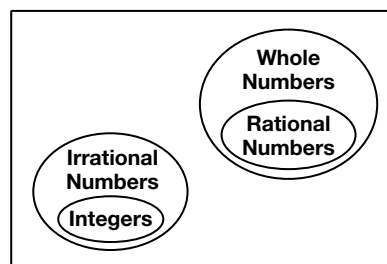
B



C



D



7 _____

8 What kind of number can be written either as a terminating decimal or as a repeating decimal?

A whole number

B integer

C rational number

D irrational number

8 _____

9 Which statement is true?

A All whole numbers are integers.

B No whole numbers are integers.

C Some integers are irrational numbers.

D All square roots are irrational numbers.

9 _____

Standards Practice

Objective 1.02 (continued)



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 6** Mr. Ko drove 237 miles from his North Carolina home to the Atlantic Coast. His average speed was 62 miles per hour. Along the way, he stopped from 1:00 P.M. until 1:50 P.M. for lunch. Which expression gives the best estimate of how many hours the trip took? **6** _____

A $(250 \div 50) + 50$
B $(280 \div 70) + 50$
C $(240 \div 60) + 1$
D $(200 \div 60) + (50 \div 60)$

- 7** The math club held a fundraiser and earned \$710. Of that amount, \$110 was a gift from a retired math teacher. The rest of the money was raised by selling candy bars. If each candy bar sold for \$0.75, how many candy bars did the math club sell? **7** _____

A 820
B 800
C 600
D 550

- 8** Farah can type approximately 60 words a minute. Her English term paper contains 10,000 words. About how many minutes will it take Farah to type her term paper? **8** _____

A 600,000 min
B 10,060 min
C 170 min
D 60 min

- 9** The sign shows discounts offered at a video store. Megan bought 4 DVDs for \$60. What was the original price of each DVD? **9** _____

A \$20
B \$25
C \$30
D \$55

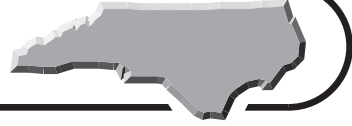
Video Sale
 $\frac{1}{4}$ off all DVDs
 $\frac{1}{3}$ off all VCR Tapes

- 10** Mr. McDougal owns a potato chip factory. Yesterday he did a quality check of 700 chips. He checked $\frac{1}{5}$ of the chips for texture and $\frac{1}{10}$ of the chips for flavor. No chip was checked for both texture and flavor. The remaining chips were checked for calorie content. How many chips were checked for calorie content? **10** _____

A 210
B 490
C 500
D 685

Standards Practice

Objective 1.03 (continued)



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 6** Gregg wants to leave a 15% tip for dinner at a restaurant. By which fraction can he multiply to compute a tip that is closest to 15% of the bill?

6 _____

A $\frac{1}{11}$

B $\frac{1}{6}$

C $\frac{3}{13}$

D $\frac{2}{7}$

- 7** The state of North Carolina has an area of 53,821 square miles, which makes it the 28th largest state in the nation. The Tidewater accounts for 750 square miles of the area of North Carolina. About what percent of North Carolina is the Tidewater?

7 _____

A 71.8%

B 28%

C 1.4%

D 0.014%

- 8** What percent of the large square is shaded?

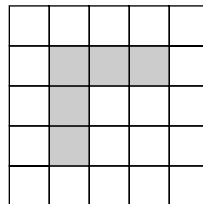
8 _____

A 25%

B 20%

C 15%

D 5%



- 9** Which number is greatest?

9 _____

A 0.35

B 0.349

C $0.\overline{35}$

D 0.351

- 10** In which list are the numbers in order from least to greatest?

10 _____

A 5.6, 5.68, 5.79, 5.8, 5.719

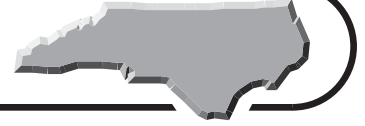
B 5.6, 5.68, 5.719, 5.79, 5.8

C 5.8, 5.719, 5.79, 5.68, 5.6

D 5.6, 5.79, 5.8, 5.68, 5.719

Standards Practice

Objective 1.04



Solve problems involving percent of increase and percent of decrease.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1** At the local deli, the price of a roast beef sandwich used to be \$4.50. The price is now \$5.85. What is the percent of increase in the cost of the sandwich? **1** _____

A 135% **B** 77%
C 30% **D** 0.3%

- 2** The table shows the price of several grocery store items several months ago and now. Which item has had the greatest percent of increase in price? **2** _____

Product	Old Price	New Price
bread	\$1.20	\$1.56
butter	\$3.60	\$4.32
milk	\$2.15	\$3.01
pears	\$.70	\$1.12

A bread **B** butter
C milk **D** pears

- 3** Last week a store sold 210 jugs of bottled water. This week it sold only 160 jugs. What is the percent of decrease in the number of jugs sold? Round to the nearest whole percent. **3** _____

A 13% **B** 24%
C 31% **D** 69%

- 4** When Wendy was born, she weighed 8 pounds 9 ounces. A year later she weighed 15 pounds 12 ounces. To the nearest whole percent, what was the percent increase in Wendy's weight? **4** _____

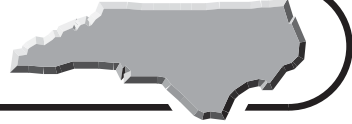
A 84% **B** 63%
C 47% **D** 1.4%

- 5** Last year a computer company had 500 laptops returned as defective. This year only 460 were returned. What was the percent decrease in the number of laptops returned? **5** _____

A 187% **B** 87%
C 8.7% **D** 8%

Standards Practice

Objective 1.04 (continued)



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 6** Last year, Jillian earned \$44,500 in commissions. This year, she earned \$42,000 in commissions. To the nearest tenth of a percent, what was the percent decrease in her commissions?

A 94% **B** 6% **C** 5.6% **D** 0.6%

6 _____

- 7** Randy found a table in an almanac showing the rainfall in three North Carolina cities during a month in the summers of 1990 and 2000. In two of the cities the amount of rainfall increased and in the third it decreased. What was the greatest percent of increase in rainfall in these three cities?

City	Rainfall (in.) 1990	Rainfall (in.) 2000
Monroe	3.5	3.0
Eden	2.1	2.4
Durham	1.9	2.7

A 42% **B** 21% **C** 14% **D** 9%

7 _____

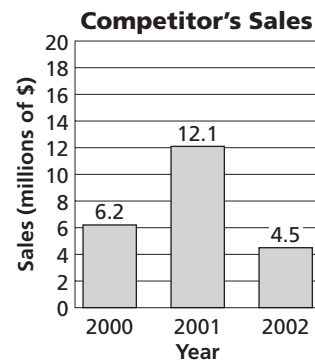
- 8** Bradley and Maci are investing in the stock market. Two years ago, their stock in one company was worth \$1,200. Last year it was worth \$1,290 and this year it is worth \$1,400. What is the approximate percent of increase in the value of the stock from two years ago to this year?

A 90% **B** 16.7% **C** 7.9% **D** 7.5%

8 _____

- 9** Monica owns a chain of health food stores. The bar graph shows information about sales for Monica's main competitor during three recent years. To the nearest percent, what was the decrease in the competitor's sales from 2001 to 2002?

A 17%
B 27%
C 53%
D 63%



9 _____

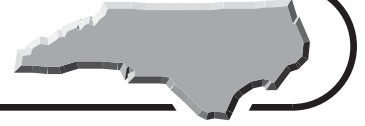
- 10** Collecting art is one of Susan's hobbies. Over the years, the value of her collection has increased from \$3,000 to \$50,000. To the nearest percent, what is the increase in the value of Susan's art collection?

A 15.7% **B** 47% **C** 1,567% **D** 47,000%

10 _____

Standards Practice

Objective 1.05



Use scientific notation to express large numbers and numbers less than one. Write in standard form numbers given in scientific notation.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

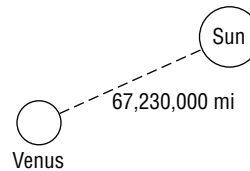
- 1 The distance from Earth to the sun is about 9.3×10^7 miles. What is this distance in standard notation?? 1 _____

A 0.00000093 mi
 B 93,000 mi
 C 93,000,000 mi
 D 930,000,000 mi

- 2 Neal's computer holds about 54,000,000 bytes of information. How is this number written in scientific notation? 2 _____

A 5.4×10^7
 B 54×10^6
 C 0.54×10^7
 D 5.4×10

- 3 Mark saw the figure shown at the right while he was reading a book on astronomy. How is the distance from Venus to the sun written in scientific notation? 3 _____



A 67.23×10^6 mi
 B 0.6723×10^8 mi
 C $6,723 \times 10^4$ mi
 D 6.723×10^7 mi

- 4 Which number is written in scientific notation? 4 _____

A 85.3×10^5
 B 3×10^8
 C 0.7×10^4
 D 0.46×10^{-6}

- 5 Mr. Montgomery told his science students that neon makes up about 0.000018 of Earth's atmosphere. How is this number written in scientific notation? 5 _____

A 18×10^{-6}
 B 18×10^{-4}
 C 1.8×10^{-5}
 D 1.8×10^{-4}

Standards Practice

Objective 1.05 (continued)

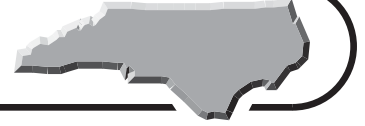


Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 6** The Uwharrie Mountains in Davidson County, North Carolina, are thought to be the oldest mountains in North America and are among the oldest in the world. They are thought to be 600 million years old. What is 600 million in scientific notation? **6** _____
- A** 6×10^5
B 6×10^6
C 6×10^7
D 6×10^8
- 7** The population of North Carolina in 1990 was 6,657,670. To the nearest hundred thousand, what was the population in 1990? **7** _____
- A** 6.7×10^7
B 7×10^6
C 6.7×10^6
D 7×10^5
- 8** At one point in its orbit, Earth is approximately 151,000,000 kilometers from the sun. What is this distance in scientific notation? **8** _____
- A** 1.51×10^8 km
B 15.1×10^7 km
C 151×10^6 km
D 1.51×10^{-8} km
- 9** Which number is least? **9** _____
- A** 7×10^{-3}
B 7×10^{-5}
C 7×10^{-8}
D 7×10^{-10}
- 10** How is 871×10^{-8} written in scientific notation? **10** _____
- A** 8.71×10^{-5}
B 8.71×10^{-6}
C 8.71×10^{-7}
D 87×10^{-5}

Standards Practice

Objective 1.06

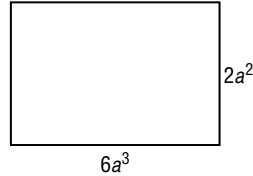


Use rules of exponents.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 Which expression gives the area of the rectangle shown at the right?

A $12a^2$
B $16a^3$
C $6a^4$
D $12a^5$



1 _____

- 2 Which expression has the same value as $3^4 \times 3^7$?

A 9^{11} **B** 3^{11}
C 3^{28} **D** 9^{28}

2 _____

- 3 Which expression is equal to $2^8 \div 2^4$?

A 2^4 **B** 1^2
C 2^2 **D** 2^{12}

3 _____

- 4 What is the value of 14^0 ?

A 14 **B** 7
C 2 **D** 1

4 _____

- 5 If a is not equal to zero, how is a^{-5} written using a positive exponent?

A $5a$ **B** $-5a$
C $\frac{1}{a^5}$ **D** $-\frac{1}{a^5}$

5 _____

- 6 How do you multiply two numbers raised to powers that have the same base?

A Add the bases and add the exponents.
B Add the exponents and keep the same base.
C Multiply the exponents and keep the same base.
D Multiply the bases and multiply the exponents.

6 _____

Standards Practice

Objective 1.07



Estimate the square root of a number between two consecutive integers; using a calculator, find the square root of a number to the nearest tenth.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

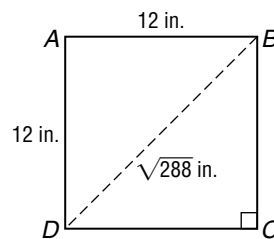
- 1 The number $\sqrt{13}$ is between which pair of consecutive integers? 1 _____
A 4 and 5 **B** 3 and 4
C 2 and 3 **D** -5 and -4

- 2 The number $\sqrt{407}$ is between which pair of consecutive integers? 2 _____
A 406 and 407 **B** 400 and 401
C 20 and 21 **D** 19 and 20

- 3 $\sqrt{94}$ is closest to which whole number? 3 _____
A 100 **B** 81
C 47 **D** 10

- 4 Which whole number has its square root between 14 and 15? 4 _____
A 230 **B** 200
C 190 **D** 185

- 5 In the figure, the length of the dashed diagonal segment BD is $\sqrt{288}$ inches. What is the length of this segment to the nearest tenth of an inch?
A 15 in.
B 16.9 in.
C 17.0 in.
D 144 in.



5 _____

- 6 What is the value of $\sqrt{6.52}$ to the nearest tenth? 6 _____
A 2.6 **B** 2.7
C 3.6 **D** 3.7

- 7 What is the value of $\sqrt{0.069}$ to the nearest tenth? 7 _____
A 0.9 **B** 0.8
C 0.3 **D** 0.2

Standards Practice

Objective 1.07 (continued)



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 8** If you know the area of a square, you can find the length of a side by finding the square root of the area. To the nearest tenth of an inch, what is the length of a side of a square whose area is 308 square inches? **8** _____
- A** 16 in. **B** 17 in.
C 17.5 in. **D** 17.6 in.
- 9** What is the value of $\sqrt{200}$ to the nearest tenth? **9** _____
- A** 14.1 **B** 20.0
C 400 **D** 500
- 10** The Wright brothers had their first successful flight near Kitty Hawk, North Carolina. Mr. Parsons finds it easy to remember the year in which the flight occurred because, to the nearest whole number, it is $\sqrt{3,621,502}$, the square root of his telephone number. In which year did the flight occur? **10** _____
- A** 1902 **B** 1903
C 1904 **D** 1905
- 11** Barney has a square garden with an area of 900 square yards. Barney wants to fence in his garden. How much fencing will he need? **11** _____
- A** 30 yd² **B** 120 yd²
C 30 yd **D** 120 yd
- 12** The formula $d = 4.9t^2$ allows you to calculate the distance in meters an object will travel in t seconds from the moment when it is dropped. To the nearest tenth of a second, how long will it take an object to hit the ground if it is dropped from a height of 99 meters? **12** _____
- A** 4.5 s **B** 20.2 s
C 22 s **D** 485.1 s
- 13** What is the value of $-\sqrt{1,936}$? **13** _____
- A** 46 **B** 44
C -44 **D** -46
- 14** Which number does not have a rational square root? **14** _____
- A** -49 **B** 1
C 5.76 **D** $\sqrt{625}$

Standards Practice

Objective 1.08



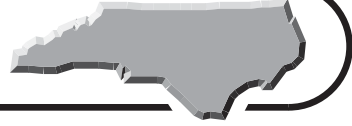
Solve problems involving exponents and scientific notation.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1** Ramon read that the diameter of a hydrogen atom is approximately 1.06×10^{-10} meter. The radius is half that value. What is the approximate radius of a hydrogen atom? **1** _____
- A** 1.06×10^{-20} m **B** 2.12×10^{-20} m
C 5.3×10^{-11} m **D** 1.06×10^{-5} m
- 2** If a computer can perform 4.5×10^8 instructions per second, how many instructions can it perform in a minute? **2** _____
- A** 2.7×10^9 **B** 2.7×10^{10}
C 2.7×10^{11} **D** 1.62×10^{12}
- 3** For what value(s) of x is $3^x = x^3$? **3** _____
- A** 0 **B** 1 **C** 2 **D** 3
- 4** The distance across a certain bacterium is only 8×10^{-4} millimeter. How many of these bacteria would it take to make a string of bacteria 1 millimeter long? **4** _____
- A** 1,250 **B** 8,500 **C** 10,000 **D** 16,000
- 5** According to one estimate, the world's population is about 6.5×10^9 people. By 2025 it may reach 7.84×10^9 . If this happens, about how many times as many people will there be in the world as there are now? **5** _____
- A** 0.83 **B** 0.9 **C** 0.95 **D** 1.21
- 6** In 2001, the population of China was 1.273×10^9 and the population of Russia was 1.423×10^8 . About how many times as great as the population of Russia was the population of China? **6** _____
- A** 0.11 **B** 0.89 **C** 1.17 **D** 8.9
- 7** Astronomers believe they have discovered a distant star with a planet that is about 385 times more massive than Earth. If the mass of Earth is 6×10^{24} kilograms, what is the mass of the planet of the other star? **7** _____
- A** 231×10^{27} kg **B** 2.31×10^{27} kg
C 2.31×10^{26} kg **D** 0.231×10^{26} kg

Standards Practice

Objective 1.08 (continued)



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

8 Which of the numbers has the least value?

A 9×10^{-7}

B 7×10^{-9}

C 9×10^{-10}

D 4×10^{-8}

8 _____

9 Tourism in North Carolina is a very important part of the state's economy. Visitors currently spend over \$1 billion dollars yearly. The approximate population of North Carolina is slightly greater than 8 million people. Suppose you were to divide the tourism dollars equally among the citizens of North Carolina. About how much would each individual receive? Use scientific notation.

A $\$1.3 \times 10^2$

B $\$10^3$

C $\$1.3 \times 10^{15}$

D $\$1.3 \times 10^{54}$

9 _____

10 Alpha Centauri, the star closest to the sun, is about 2.4×10^{13} miles away from the sun. The distance that light travels in one year, called a light year, is slightly less than 6×10^{12} miles. Approximately how many years does it take light to travel from Alpha Centauri to the sun?

A 9.6×10^{25} yr

B 9.6×10^1 yr

C 4×10^1 yr

D 4 yr

10 _____

11 If you write a number as the product of powers of prime numbers, you have written its prime factorization. For example, the prime factorization of 275 is $5^2 \times 11$. What is the prime factorization of 275^3 ?

A $5^6 \times 11^3$

B $3 \times 5^2 \times 11$

C $3 \times 5^3 \times 11^2$

D $5^3 \times 11^2$

11 _____

12 Which expression can you evaluate to find the number of seconds in one year?

A $365 \times 60 \times 24$

B $365 \times 60^2 \times 24$

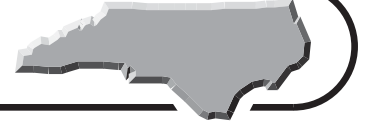
C 365×60^2

D $(60^2 \times 24)^{365}$

12 _____

Standards Practice

Objective 1.09



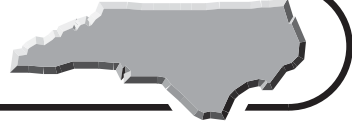
Determine the absolute value of a number.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 Which tells how you can use a number line to find $|-8|$? 1 _____
A Find the distance from 0 to -8 .
B Find the distance from -8 to 8.
C Find the number halfway between 0 and -8 .
D Find the number halfway between 8 and -8 .
- 2 What is $-|-13|$? 2 _____
A -26 **B** -13
C 13 **D** 26
- 3 Which number is equal to $|13 - 18|$? 3 _____
A -5 **B** 0
C 5 **D** 31
- 4 How many integers between -20 and 20 have an absolute value less than 5? 4 _____
A 25 integers **B** 11 integers
C 10 integers **D** 9 integers
- 5 Which equation is true? 5 _____
A $|-9| = -9$ **B** $|-9| = -|9|$
C $|9| = -|9|$ **D** $|-9| = -(-9)$
- 6 Which equation is true for all values of b ? 6 _____
A $\sqrt{b^2} = b$ **B** $\sqrt{b^2} = |b|$
C $\sqrt{-b^2} = -|b|$ **D** $(\sqrt{b})^2 = |-b|$
- 7 Which is a true sentence about $|x + y|$ for all values of x and y ? 7 _____
A It is greater than $|x - y|$.
B It is less than $|y - x|$.
C It is greater than $|y| + |x|$.
D It is no greater than $|x| + |y|$.

Standards Practice

Objective 1.09 (continued)

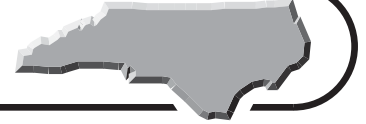


Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 8** Ming listed the absolute values of the integers from -10 to 5 , inclusive. How many different integers were in the list of absolute values? **8** _____
- A** 16 **B** 15
C 11 **D** 10
- 9** What is the value of $|7| + |-8|$? **9** _____
- A** -15 **B** -1
C 1 **D** 15
- 10** What is the value of $|-10| + |-9|$? **10** _____
- A** -19 **B** -1
C 1 **D** 19
- 11** How many numbers have an absolute value of -24 ? **11** _____
- A** none **B** 1 number
C 2 numbers **D** 3 numbers
- 12** Which equation is true? **12** _____
- A** $\left|\frac{-2}{3}\right| = -\frac{2}{3}$ **B** $\left|\frac{-2}{-3}\right| = -\left|\frac{2}{3}\right|$
C $\left|\frac{2}{3}\right| = \left|\frac{-2}{3}\right|$ **D** $\left|\frac{2}{-3}\right| = -\frac{2}{3}$
- 13** If you double a certain number, its absolute value remains unchanged. What is the number? **13** _____
- A** -1 **B** 0
C 1 **D** $|-1|$
- 14** Which has the same value as $|200 - 43|$? **14** _____
- A** $|200 + 43|$ **B** $200 - (-43)$
C $|-43| - 200$ **D** $200 - 43$

Standards Practice

Objective 1.10



Identify, explain, and apply the commutative, associative, and distributive properties, inverses, and identities in algebraic expressions.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 Which equation uses the Commutative Property of Addition? **1** _____
- A** $2x + (y + z) = (2x + y) + z$
B $(2x + y) + z = (y + 2x) + z$
C $(2x + y) + 0 = 2x + y$
D $2x + 3x = (2 + 3)x$
- 2 Which property allows you to rewrite $7m + (-5m)$ as $m(7 + (-5))$? **2** _____
- A** Associative Property of Addition
B Commutative Property of Addition
C Distributive Property
D Identity Property of Multiplication
- 3 Which property does the equation $12a + (-12a) = 0$ illustrate? **3** _____
- A** Associative Property of Addition
B Commutative Property of Addition
C Identity Property of Addition
D Inverse Property of Addition
- 4 Which equation illustrates the Identity Property of Multiplication? **4** _____
- A** $6x(1) = 6x$ **B** $(6x) \cdot 0 = 0$
C $\frac{2}{3}(\frac{3}{2}) = 1$ **D** $x \cdot (-x) = -x^2$
- 5 What is the multiplicative inverse of $\frac{1}{-8}$? **5** _____
- A** 8 **B** $-\frac{1}{8}$
C -8 **D** $-8(8)$
- 6 What expression do you get if you use only the Associative Property of Multiplication to write an expression equivalent to $25 \cdot (4n)$? **6** _____
- A** $25 \cdot (n \cdot 4)$ **B** $(25 \cdot 4)n$
C $4n \cdot (25)$ **D** $4(n \cdot 25)$

Standards Practice

Objective 1.10 (continued)

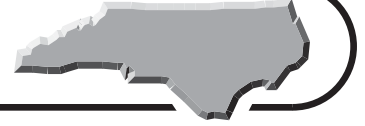


Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 7** Which equation uses the Identity Property of Addition? **7** _____
- A** $2y + 0 = 0 + 2y$
B $2y + 0 = 2y$
C $y + y = 2y$
D $0(y) = 0$
- 8** Which expression do you get if you use the Distributive Property to write an expression equivalent to $x(a + b) + y(a + b)$? **8** _____
- A** $y(a + b) + x(a + b)$
B $xy(a + b)$
C $ab(x + y)$
D $(x + y)(a + b)$
- 9** Which equation illustrates the Associative Property of Addition? **9** _____
- A** $(5 + 5x) + 3y = 5 + (5x + 3y)$
B $(5 + 5x) + 3y = 5(1 + x) + 3y$
C $(5 + 5x) + 3y = (5x + 5) + 3y$
D $5 + (5x + 3y) = 5 + (3y + 5x)$
- 10** Which equation illustrates the Commutative Property of Multiplication? **10** _____
- A** $5\left(-\frac{3}{8}\right) = -15\left(\frac{1}{8}\right)$ **B** $5\left(-\frac{3}{8}\right) = \left(-\frac{3}{8}\right)5$
C $5\left(-\frac{3}{8}\right) = 5\left(-\frac{3}{8}\right)$ **D** $5\left(-\frac{3}{8}\right) = 5\left(\frac{3}{-8}\right)$
- 11** Which property would be most helpful in computing $(89 + 36) + 14$ mentally? **11** _____
- A** Associative Property of Addition
B Commutative Property of Addition
C Identity Property of Addition
D Inverse Property of Addition
- 12** Which property of multiplication involves more than two factors? **12** _____
- A** Associative Property of Multiplication
B Commutative Property of Multiplication
C Identity Property of Multiplication
D Inverse Property of Multiplication

Standards Practice

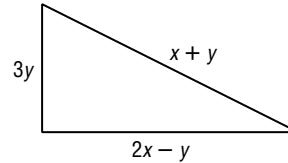
Objective 1.11



Simplify algebraic expressions.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 Add the lengths of the sides of the triangle to find its perimeter. Show the result in simplest form.



1 _____

A $\left(\frac{1}{2}\right)(3y)(2x - y)$

B $3x + 3y$

C $3x + 4y$

D $4x + 3y$

- 2 Simplify $(3m - n) + (7n - 3m)$.

A $6n - 6m$

B $6n + 6m$

C $-6n$

D $6n$

2 _____

- 3 Simplify $c(1 + 2d) - cd$.

A $c + 2d - cd$

B $c - cd$

C $c + cd$

D $c + d$

3 _____

- 4 Simplify $\frac{x}{2} + \frac{2x}{7}$.

A $\frac{3x}{9}$

B $\frac{3x}{14}$

C $\frac{11x}{14}$

D $\frac{11x}{9}$

4 _____

- 5 Simplify $2x \cdot 0 \cdot \frac{1}{2}x$, where $x \neq 0$.

A 0

B 1

C $\frac{x}{2}$

D $\frac{2}{x}$

5 _____

- 6 How many total seconds are there in k hours, $(k - 2)$ minutes, and $(k + 3)$ seconds?

A $3,660k - 117$

B $3,660k - 120$

C $3,661k - 120$

D $3,661k - 117$

6 _____

- 7 There are 100 years in a century and 10 years in a decade. How many years in all are there in x centuries and x decades?

A $110x$

B $101x$

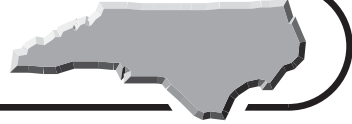
C $99x$

D $90x$

7 _____

Standards Practice

Objective 1.11 (continued)



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

8 Which expression simplifies to $6y - 3x$? 8 _____

- A $6(y - 3x)$
- B $4(y - x) + x + 2y$
- C $5y - (y - 3x)$
- D $4(y - x) + 2(y + x)$

9 What is the sum of $8c + 2d$ and $d - 4c$ in simplest form? 9 _____

- A $9c - 2d$
- B $-4c + 3d$
- C $4c + 3d$
- D $12c + 3d$

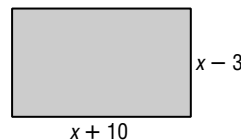
10 The value in cents of x nickels, y dimes, and x quarters can be represented by the expression $5x + 10y + 25x$. What is the simplest form of this expression? 10 _____

- A $30x + 10y$
- B $40x$
- C $40x + 40y$
- D $40x + 10y$

11 Simplify $2(5q - 3) + (7q - 1) - 4(q - 1)$. 11 _____

- A $13q - 3$
- B $13q - 5$
- C $13q - 8$
- D $13q - 6$

12 If the dimensions on the figure represent lengths in inches, and $x = 15$, multiply the length and width of the rectangle to find its area. Express the result in simplest form.



- A $(x^2 + 7x - 30) \text{ in}^2$
- B 195 in^2
- C 300 in^2
- D $(225x^2 - 30) \text{ in}^2$

12 _____

13 Which expression can be simplified to obtain $x^2 - y^2$? 13 _____

- A $(x^2 - 4) - (y^2 - 4)$
- B $(x^2 - 4) + (y^2 - 4)$
- C $(x^2 + 4) - (y^2 - 4)$
- D $x(x - y)$

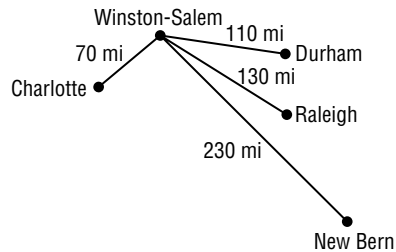
Standards Practice

Objective 1.12 (continued)



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 5** Milbern plans on leaving his home in Winston-Salem at 8:00 A.M. He will drive at an average speed of 40 miles per hour and plans to arrive at his destination just before 11:00 A.M. If he makes no stops along the way, which of the four cities is his destination?



5 _____

- A** Charlotte **B** Durham
C Raleigh **D** New Bern

- 6** Jennifer is a much better tic-tac-toe player than Willie. They decide to have a contest. Every time Jennifer wins a game, she will earn 3 points. Every time Willie wins a game, he will earn 5 points. If they play 48 games and the final score is tied, how many games did Jennifer win?

6 _____

- A** 50 **B** 40
C 30 **D** 18

- 7** A magician wants to know exactly how many people are in the audience of his magic show. He knows there are 400 seats and that he sold 390 tickets and gave out 10 complimentary tickets to special guests. What piece of information is he missing, if any?

7 _____

- A** the dimensions of the audience area
B whether all the ticket holders are attending the show
C whether the special guests are newspaper reporters
D He is not missing any information. There must be 400 people in the audience.

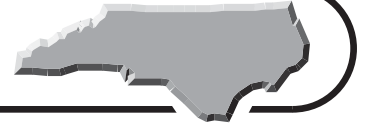
- 8** Mark left home on a car trip at 10:00 A.M. His average driving speed was 62 miles per hour. His only stop was at a restaurant for 1 hour for lunch. At lunch, he made two 10-minute calls on his cell phone. He arrived at his destination at 4:15 P.M.. Which piece of information is not necessary to calculate how far he drove?

8 _____

- A** the time he left home
B the information about the phone calls
C the time he was at the restaurant
D his average driving speed

Standards Practice

Objective 2.01

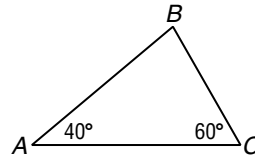


Use geometric concepts and modeling to interpret and solve problems.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 What is the measure of $\angle B$ in the triangle shown at the right?

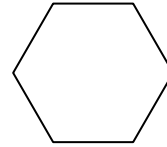
A 90
B 80
C 65
D 50



1 _____

- 2 How many lines of symmetry are there for the regular hexagon shown at the right?

A 2
B 4
C 6
D 8



2 _____

- 3 Shanita has a rectangular patio behind her house. The patio is 10 yards long by 8 yards wide. Shanita wants to put pots of flowers at each corner and space other pots along the sides every 2 yards. How many flower pots does she need?

A 18
B 16
C 14
D 9

3 _____

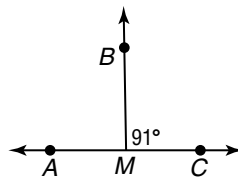
- 4 You are wrapping party gifts and plan to put a yellow bow on each gift box. Each bow uses 6 inches of ribbon. You have two pieces of ribbon, one 42 inches long and the other 60 inches long. This is just enough ribbon for the bows. How many cuts will you need to make in the ribbon to get the pieces you need for the bows?

A 18
B 17
C 16
D 15

4 _____

- 5 Which word describes $\angle AMB$?

A straight
B right
C obtuse
D acute



5 _____

Standards Practice

Objective 2.01 (continued)



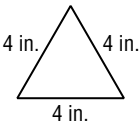
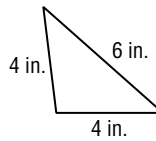
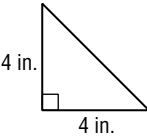
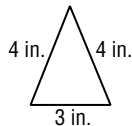
Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

6 Which of these could be the lengths of the sides of a triangle?

- A** 3 cm, 4 cm, 7 cm **B** 4 cm, 9 cm, 12 cm
C 5 cm, 6 cm, 13 cm **D** 2 cm, 8 cm, 6 cm

6 _____

7 Which triangle is an equilateral triangle?

- A**  **B** 
- C**  **D** 

7 _____

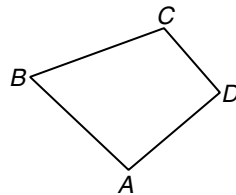
8 Which statement is true?

- A** No squares are parallelograms.
B Some trapezoids are parallelograms.
C All squares are rectangles.
D Some trapezoids are rectangles.

8 _____

9 What is the sum of the measures of the interior angles of the figure shown at the right?

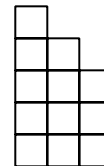
- A** 360 **B** 270
C 180 **D** 90



9 _____

10 The figure pictured at the right is made up of squares that measure 1 centimeter on each side. Suppose you cut the figure apart and rearrange the squares to make a rectangle. What is the greatest perimeter you can obtain for such a rectangle?

- A** 14 cm **B** 16 cm
C 26 cm **D** 32 cm



10 _____

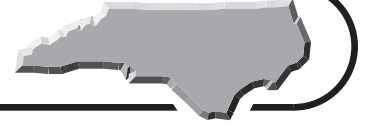
11 Which kind of figure has exactly one pair of parallel sides?

- A** rhombus **B** rectangle
C pentagon **D** trapezoid

10 _____

Standards Practice

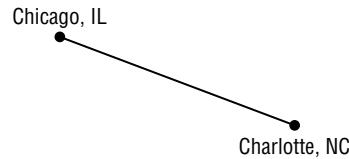
Objective 2.02



Calculate distances and areas from scale drawings and maps.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1** Jordan will be traveling from Charlotte to Chicago, Illinois. She measured the distance between the two cities on a map as 2.5 inches. If 1 inch on the map represents 400 miles, what is the approximate distance from Charlotte to Chicago?



1 _____

- A** 600 mi **B** 800 mi
C 1,000 mi **D** 1,200 mi

- 2** Suppose you ask a photographer to take a picture of your yard from an airplane. Your house is a rectangle that measures 40 feet by 20 feet. In the photograph it measures 2 centimeters by 1 centimeter. What are the actual dimensions of your yard if it measures 7 centimeters by 10 centimeters in the photograph?

2 _____

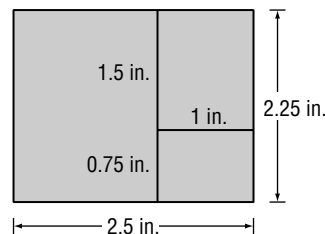
- A** 280 ft × 200 ft **B** 140 ft × 200 ft
C 140 ft × 100 ft **D** 70 ft × 100 ft

- 3** What scale factor would you use to reduce a photo that is 5 inches by 8 inches to get a copy that is 1.5 inches by 2.4 inches?

3 _____

- A** 0.7 **B** 0.3
C 0.03 **D** 0.07

For Questions 4 and 5, use the diagram at the right. It shows a scale drawing of a yard that has three rectangular sections. The scale is 0.25 inch to 5 feet.



- 4** What are the actual dimensions of the smallest section of the yard?

4 _____

- A** 10 ft × 15 ft **B** 15 ft × 15 ft
C 15 ft × 20 ft **D** 30 ft × 20 ft

- 5** What is the area of the entire yard?

5 _____

- A** 2,250 ft² **B** 1,250 ft²
C 1,250 ft **D** 50 ft × 25 ft

Standards Practice

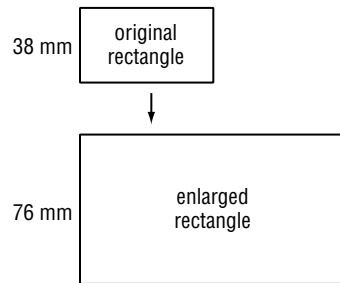
Objective 2.02 (continued)



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 6 Refer to the diagram at the right. What scale factor was used to obtain the larger rectangle from the smaller rectangle?

A $\frac{1}{2}$ B $\frac{2}{1}$
 C $\frac{2}{3}$ D $\frac{1}{4}$



6 _____

- 7 You want to make a scale drawing of a friend's bedroom. The scale for the drawing is 3 inches = 2 feet. The bedroom is a rectangle that measures 15 feet by 18 feet. What will be the dimensions of the drawing?

A 22.5 in. by 27 in. B 30 in. by 36 in.
 C 45 in. by 54 in. D 30 in. by 54 in.

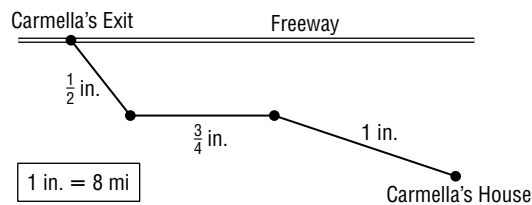
7 _____

- 8 Hector is designing a garden in the shape of a right triangle for his backyard. The legs of the right triangle measure 12 yards and 35 yards respectively, while the hypotenuse measures 37 yards. If Hector wants to make a scale drawing of his garden to send to his brother Manuel, which scale is reasonable if he is to place the drawing on a sheet of notebook paper, which measures 8.5 inches by 11 inches?

A 1 in. = 3 ft B 0.5 in. = 1 yd
 C 1 in. = 1 yd D 1 in. = 6 yds

8 _____

- 9 Carmella is hosting a party at her house. The invitations include a map showing how to get to her house from the freeway. Use the map to find the approximate distance from the freeway to Carmella's house.



A 2.25 mi B 9 mi C 18 mi D 27 mi

9 _____

- 10 Nelly wants to increase the area of a rectangular document she is going to use in a presentation. She would like the area of the new document to be four times the area of the original document. By what factor should she multiply the dimensions?

A 8 B 6 C 4 D 2

10 _____

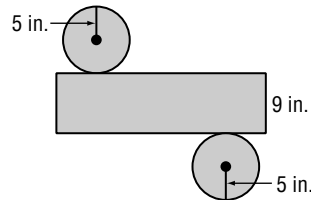
Standards Practice

Objective 2.03 (continued)



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 6** Mattie is going to cut out a figure with the dimensions shown at the right and fold it to make a cylinder. What will be the approximate lateral area of the cylinder?



6 _____

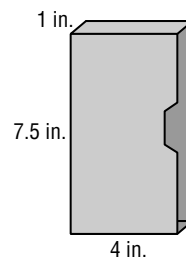
- A** 283 in^2
B 292 in^2
C 361.3 in^2
D 439.8 in^2

- 7** What is the approximate surface area of a cylindrical juice can that has a height of $6\frac{1}{2}$ inches and a radius of 2 inches?

7 _____

- A** 25.1 in^2
B 81.7 in^2
C 94.2 in^2
D 106.8 in^2

- 8** A box for a videocassette tape is open on one side, as shown in the figure. About how many square inches of cardboard are needed to make the box?



8 _____

- A** 83 in^2
B 79 in^2
C 75.5 in^2
D 30 in^2

- 9** A worker is going to paint a water tank that is a right circular cylinder. The bottom face will not be painted but the top face will have two coats of paint. If the height of the tank is 40 feet, the radius is 10 feet, and a gallon of paint covers 200 square feet, how many gallons of paint are needed for the job?

9 _____

- A** 17 gal **B** 16 gal
C 15 gal **D** 14 gal

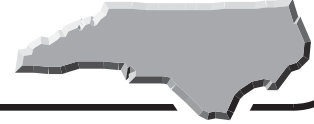
- 10** A drinking straw is 19 centimeters long and has a diameter of 0.6 centimeter. To the nearest whole number, how many total square centimeters of plastic are used to make the straws in a box of 100 straws?

10 _____

- A** $3,581 \text{ cm}^2$ **B** $3,638 \text{ cm}^2$
C $3,738 \text{ cm}^2$ **D** $3,837 \text{ cm}^2$

Standards Practice

Objective 2.04

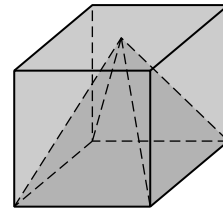


Use models to investigate the relationship of the volume of a cone to a cylinder and pyramid to a prism with the same base and height.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1** The figure shows a pyramid with a square base that fits exactly inside a rectangular box. The volume of the pyramid is 600 cubic inches. What is the volume of the box?

A 2,400 in³ **B** 1,800 in³
C 1,200 in³ **D** 900 in³



1 _____

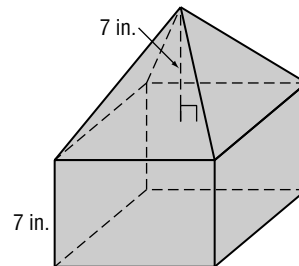
- 2** A right cone and a right cylinder have circular bases that are the same size. If the heights of the cone and cylinder are the same, what is the ratio of the volume of the cone to the volume of the cylinder?

A 1:3 **B** 2:3 **C** 3:1 **D** 3:2

2 _____

- 3** The solid figure shown at the right is made from a rectangular prism and a pyramid. What is the ratio of the volume of the rectangular prism to the volume of the entire figure?

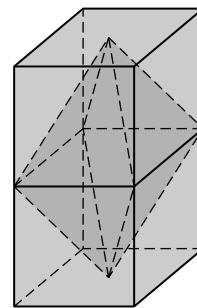
A 4:5 **B** 3:5
C 2:3 **D** 3:4



3 _____

- 4** A metal object is made from two same-size square pyramids that are joined at their bases. The object is to be shipped in a rectangular box, as shown in the figure. The space between the object and the box will be filled with packing material. If the volume of the object is 48 cubic inches, how much space is there for packing material?

A 144 in³ **B** 128 in³
C 96 in³ **D** 32 in³



4 _____

- 5** A cylindrical metal tube holds conical paper drinking cups. The height of the metal tube is 5 times the height of an individual drinking cup. How many times greater than the volume of a drinking cup is the volume of the metal tube?

A 25 times **B** 15 times **C** 10 times **D** 5 times

5 _____

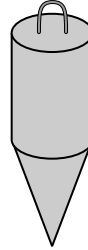
Standards Practice

Objective 2.04 (continued)



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 6** The plumb bob shown in the figure combines a cylinder and a cone that have equal heights. If the volume of the cylindrical portion of the bob is 6 cubic centimeters, what is the total volume of the bob?



6 _____

- A** 8 cm^3
B 9 cm^3
C 10 cm^3
D 12 cm^3

- 7** A right cone and a right cylinder have the same height. The volume of the cone is 300 cubic inches, and the volume of the cylinder is 900 cubic inches. The radius of the cylinder is 6 inches. What is the radius of the base of the cone?

7 _____

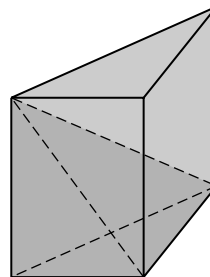
- A** 6 in.
B 4 in.
C 3 in.
D 2 in.

- 8** A rectangular box and a rectangular pyramid have bases that have the same dimensions. Their heights are also the same. If each is filled with dry sand, how much heavier will the sand in the rectangular box be than the sand in the pyramid?

8 _____

- A** 6 times
B 4 times
C 3 times
D 2 times

- 9** The triangular prism and the triangular pyramid shown in the figure share a common base. The space between the prism and the pyramid has a volume of 54 cubic feet. What is the volume of the pyramid?



9 _____

- A** 48 ft^3
B 36 ft^3
C 32 ft^3
D 27 ft^3

Standards Practice

Objective 2.05



Find the volume of prisms, cylinders, pyramids, and cones, with and without models.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1** Mindy's father is building a doll house that will resemble one of the southern homes of the 1800s. He has decided to build it in the shape of a rectangular prism 35 inches by 32 inches by 22 inches. What will the volume of the doll house be?

A 89 in.^3 **B** $3,780 \text{ in.}^3$
C $24,640 \text{ in.}^3$ **D** $42,875 \text{ in.}^3$

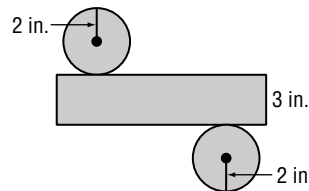
1 _____

- 2** The first gold mine in the United States was the Reed Gold Mine in Cabarrus County. Several large nuggets were found at the mine. Suppose one of these nuggets had been melted down to make a right cylinder 1.4 centimeters in diameter and 3 centimeters tall. What would have been the approximate volume of the gold cylinder?

A 1.5 cm^3 **B** 4.6 cm^3
C 13.2 cm^3 **D** 16.3 cm^3

2 _____

- 3** Tony cut out a figure with the dimensions shown at the right and folded it to make a cylinder. What is the approximate volume of the cylinder that he made?



3 _____

- A** 80.4 in.^2 **B** 70.4 in.^3
C 62.8 in.^3 **D** 37.7 in.^3

- 4** A pyramid has a height of 10 inches and a square base with an area of 36 square inches. What is the volume of the pyramid?

A 432 in.^3 **B** 360 in.^3
C 120 in.^3 **D** 60 in.^3

4 _____

- 5** Henry is building a concrete driveway at his house. The driveway is 15 feet wide, 75 feet long, and 6 inches thick. If a cubic yard of mixed concrete sells for \$60, how much will the concrete for the driveway cost?

A \$15,000 **B** \$6,750
C \$1,250 **D** \$562.50

5 _____

Standards Practice

Objective 2.05 (continued)



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

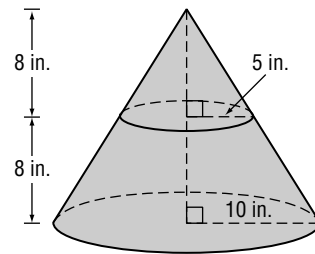
- 6** Mickie must design a box to package microwave ovens for shipping. His boss tells him that the box must be 10 inches taller than it is wide, and it must be three times as long as it is wide. If x represents the depth of the box, which expression represents the volume of the box in cubic inches?

A $3x^2(x + 10)$ **B** $5x + 10$
C $3x(x + 10)$ **D** $5x^2 + 10$

6 _____

- 7** The smaller cone in the figure will be removed from the top of the larger cone. The part of the larger cone that remains is known as a frustum. What is the approximate volume of the frustum?

A $1,675.5 \text{ in}^3$
B $1,466.1 \text{ in}^3$
C 209.4 in^3
D 101.1 in^3



7 _____

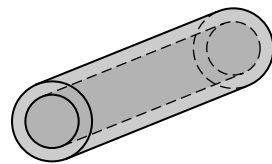
- 8** A rectangular room is 15 feet long and 12 feet wide. The volume of the room is 1,440 cubic feet. How tall is the room?

A 8 ft **B** 9 ft
C 10 ft **D** 12 ft

8 _____

- 9** Dau works for a company that manufactures plastic pipes similar to the one in the diagram. If the pipe is 8 feet long, with an outside diameter of 1 foot and an inside diameter of 8 inches, what is the approximate volume of plastic needed to manufacture the pipe?

A 6.3 ft^3 **B** 3.5 ft^3
C 2.8 ft^3 **D** 2 ft^3



9 _____

- 10** Tamika has just installed a circular above-ground pool in her back yard and is preparing to fill it with water. Water costs \$0.13 per cubic foot. If the pool has a radius of 12 feet and will be filled to a depth of 4 feet, how much will the water cost?

A \$23,524.25 **B** \$2,352.42
C \$235.24 **D** \$23.52

10 _____

Standards Practice

Objective 2.06



Use the Pythagorean Theorem to solve problems.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

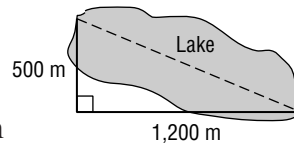
- 1** Ned and Roberta are runners. On Saturday, they met at Ned's house before each of them went for a run. They both left at the same time. Ned ran directly east at 7 miles per hour while Roberta ran directly north at 5.6 miles per hour. About how far apart were they after 2 hours?

A 18 mi **B** 12.6 mi
C 9 mi **D** 1.4 mi

1 _____

- 2** A surveyor who wanted to find the distance across a lake found the measures shown in the figure. What is the distance across the lake?

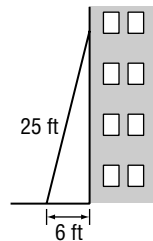
A 1,700 m **B** 1,500 m
C 1,300 m **D** 1,250 m



2 _____

- 3** Tyrone props a 25-foot ladder against the outside wall of a house so that the foot of the ladder is 6 feet from the wall. To the nearest foot, how high up the wall does the ladder reach?

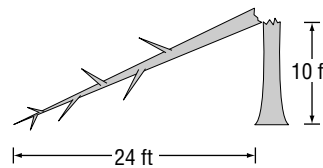
A 24 ft **B** 22 ft
C 21 ft **D** 20 ft



3 _____

- 4** A dead tree snapped 10 feet above the ground during a storm. A cleanup crew measured the distance from the point where the top of the tree touched the ground to the base of the tree and found it to be 24 feet. How tall was the tree before it snapped?

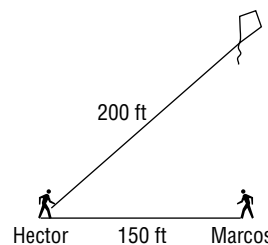
A 36 ft **B** 34 ft
C 30 ft **D** 26 ft



4 _____

- 5** Hector was in the park flying his kite with Marcos, who was standing directly under the kite. Hector was 150 feet from Marcos. If the kite string was 200 feet long, how high was the kite? Answer to the nearest foot.

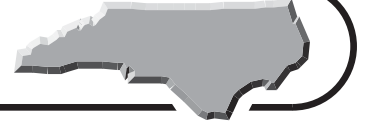
A 50 ft **B** 132 ft
C 175 ft **D** 350 ft



5 _____

Standards Practice

Objective 2.07



Determine the effect on the volume of solid figures when one or more dimension is changed.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1** An architect's model of a skyscraper uses a scale of 1:30. What part of the volume of the actual skyscraper is the volume of the model? **1** _____
- A** $\frac{1}{30}$ **B** $\frac{1}{900}$ **C** $\frac{1}{27,000}$ **D** $\frac{1}{81,000}$
- 2** Two ice cream cones have the same height. The open end of one has a diameter of $2\frac{3}{4}$ inches, while the open end of the other has a diameter of $2\frac{1}{16}$ inches. What fraction of the volume of the larger cone is the volume of the smaller cone? **2** _____
- A** $\frac{3}{16}$ **B** $\frac{9}{16}$ **C** $\frac{2}{3}$ **D** $\frac{3}{4}$
- 3** Two pyramids have bases that are exactly the same size and shape. The height of the first pyramid is 5 times the height of the second pyramid. Which statement correctly compares their volumes? **3** _____
- A** The volume of the first pyramid is 5 times that of the second.
B The volume of the first pyramid is 25 times that of the second.
C The volume of the second pyramid is 125 times that of the first.
D The volume of the second pyramid is 25 times that of the first.
- 4** Two prisms have exactly the same shape, but all the edges of the first prism are $\frac{3}{2}$ as long as the corresponding edges of the second prism. What is the ratio of the volume of the first prism to the volume of the second prism? **4** _____
- A** $\frac{4}{9}$ **B** $\frac{27}{8}$ **C** $\frac{3}{2}$ **D** $\frac{9}{4}$
- 5** One rectangular prism has length ℓ units, width w units, and height h units. A second rectangular prism has length 5ℓ units, width $5w$ units, and height h units. What is the ratio of the volume of the first prism to that of the second prism? **5** _____
- A** 25:1 **B** 5:1 **C** 1:5 **D** 1:25

Standards Practice

Objective 2.07 (continued)



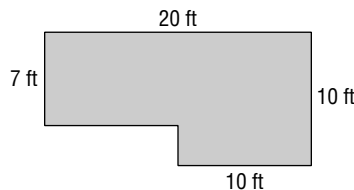
Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 6** Adrian is shipping two gifts in rectangular boxes. The boxes are exactly the same shape but different sizes. If the first box has a volume of 16 cubic feet and the second has a volume of 2 cubic feet, how many times the length of the first box is the length of the second box?

6 _____

- A** 8 times
B $\frac{1}{2}$ times
C $\frac{1}{4}$ times
D $\frac{1}{8}$ times

- 7** Kurt is planning to build a pool that has the shape shown at the right. He is trying to decide whether to make the pool 4 feet deep or 6 feet deep. How many times the volume of the smaller pool would the volume of the larger pool be?



7 _____

- A** $\frac{3}{2}$ times
B $\frac{1}{2}$ times
C $\frac{1}{4}$ times
D $\frac{1}{8}$ times

- 8** Cube A has a volume of 125 cubic units. Cube B has a volume of 216 cubic units. What is the ratio of the length of an edge of cube B to the length of an edge of cube A?

8 _____

- A** $\frac{25}{36}$ **B** $\frac{5}{6}$
C $\frac{6}{5}$ **D** $\frac{36}{25}$

- 9** What effect does multiplying the lengths of all edges of a prism by 8 have on the volume of the prism?

9 _____

- A** The volume is multiplied by 8.
B The volume is multiplied by 64.
C The volume is multiplied by 512.
D The volume is multiplied by 4,096.

Standards Practice

Objective 2.08

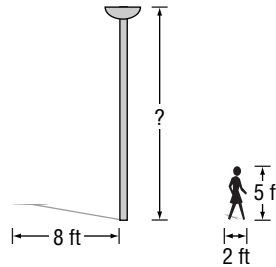


Solve problems related to similar and congruent figures.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 Heather is standing in the sun close to a lamp post. Heather is 5 feet tall and her shadow is 2 feet long. The shadow of the lamp post is 8 feet long. How tall is the lamp post?

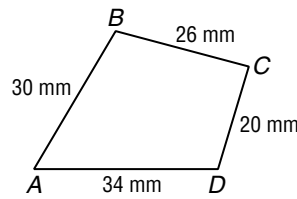
A 20 ft **B** 18 ft
C 16 ft **D** 14 ft



1 _____

- 2 The polygon $MNPQ$ is congruent to the polygon $ABCD$ shown at the right. What is the length of segment PQ ?

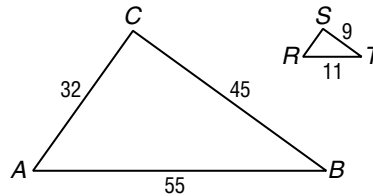
A 34 mm **B** 30 mm
C 26 mm **D** 20 mm



2 _____

- 3 Refer to the figure at the right. $\triangle ABC$ is similar to $\triangle RTS$. Which proportion can you solve to find the length x of RS ?

A $\frac{x}{11} = \frac{45}{32}$ **B** $\frac{x}{32} = \frac{9}{45}$
C $\frac{x}{55} = \frac{9}{55}$ **D** $\frac{32}{45} = \frac{x}{11}$



3 _____

- 4 $\triangle PQR$ is similar to $\triangle XYZ$. The sides of $\triangle PQR$ have lengths 24 feet, 32 feet, and 36 feet. The shortest side of $\triangle XYZ$ has a length of 3 feet. What is the perimeter of $\triangle XYZ$?

A 11.5 ft **B** 15 ft
C 15.5 ft **D** 16 ft

4 _____

- 5 Two flower beds in a park are similar rectangles. The longest side of the large flower bed is 24 feet long, and the longest side of the small flower bed is 8 feet. If L is the area of the large flower bed and S is the area of the small flower bed, which equation is true?

A $S = L - 16$ **B** $S = L + 16$
C $S = \frac{1}{9}L$ **D** $S = \frac{1}{3}L$

5 _____

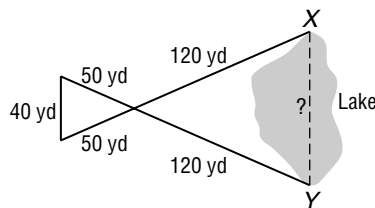
Standards Practice

Objective 2.08 (continued)



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

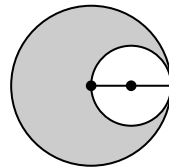
- 6 To find the distance across a lake, Mildred set up similar triangles, as shown in the figure. What is the distance XY across the lake?



6 _____

- A 96 yd
B 106 yd
C 120 yd
D 130 yd

- 7 Refer to the figure at the right. The radius of the large circle is equal to the diameter of the small circle. If the area of the small circle is 13 square feet, what is the area of the shaded region?



7 _____

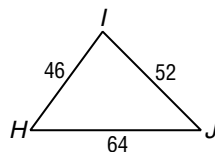
- A 52 ft^2
B 48 ft^2
C 39 ft^2
D 26 ft^2

- 8 If $\triangle ACF \cong \triangle PVK$, what is the ratio $AC:PV$?

8 _____

- A 2:3
B 1:2
C 2:1
D 1:1

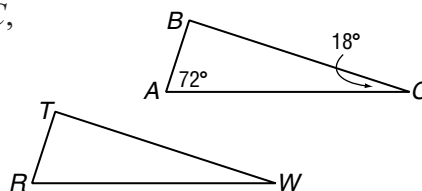
- 9 Which are the side lengths of a triangle similar to the triangle shown in the figure?



9 _____

- A 23, 26, 32
B 25, 28, 34
C 44, 50, 62
D 92, 104, 118

- 10 Refer to the figure. If $\triangle RTW \cong \triangle ABC$, what is the measure of $\angle T$?



10 _____

- A 12
B 72
C 80
D 90

Standards Practice

Objective 2.09

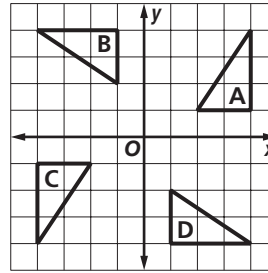


Locate, give the coordinates of, and graph plane figures which are the results of rotations (multiples of 90 degrees). Graph plane figures which are similar to a given figure (dilations).

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 Which figure is the image resulting from a 90° counterclockwise rotation of figure B around the origin?

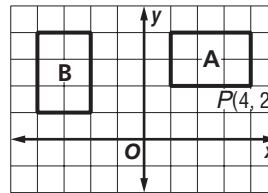
A figure A
B figure B
C figure C
D figure D



1 _____

- 2 Rectangle B is the image of rectangle A for a 90° counterclockwise rotation around the origin. The point $P(4, 2)$ is a vertex of rectangle A. What are the coordinates of the image of point P?

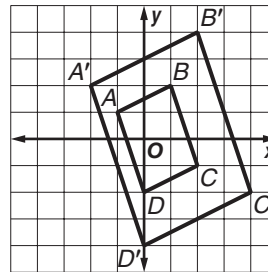
A $(-2, 4)$ B $(-4, -4)$
C $(-4, 1)$ D $(-2, 1)$



2 _____

- 3 Polygon $A'B'C'D'$ is the dilation image of polygon $ABCD$, with center at the origin. What dilation factor was used?

A 3 B 2
C $\frac{1}{2}$ D $\frac{1}{4}$



3 _____

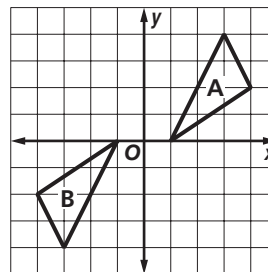
- 4 A dilation with scale factor $\frac{5}{2}$ and center at the origin is used to dilate a polygon. One vertex of the polygon is $K(6, 10)$. What are the coordinates of the image vertex K' ?

A $(25, 15)$ B $(-15, 25)$ C $(-15, -25)$ D $(15, 25)$

4 _____

- 5 Which rotation around the origin was used to obtain figure B as the image of figure A?

A 90° counterclockwise
B 90° clockwise
C 180° clockwise
D 270° counterclockwise



5 _____

Standards Practice

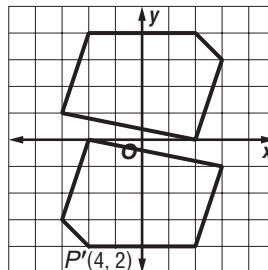
Objective 2.09 (continued)



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 6 The point $P'(-2, -4)$ is the image of a vertex of the top polygon after a 180° counterclockwise rotation around the origin. What are the coordinates of the preimage point P ?

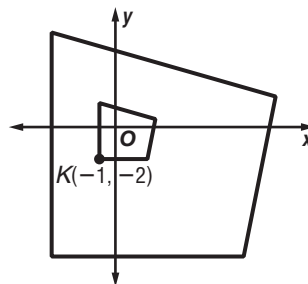
A (3, 3)
 B (2, 4)
 C $(-2, 4)$
 D (2, 0)



6 _____

- 7 A scale factor of 4 was used to dilate the small polygon with respect to the origin. What are the coordinates of the image K' of the vertex $K(-1, -2)$?

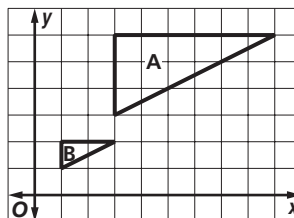
A $(6, -8)$
 B $(-6, 8)$
 C $(-8, -4)$
 D $(-4, -8)$



7 _____

- 8 A dilation with respect to the origin was used to obtain figure B from figure A. What scale factor was used?

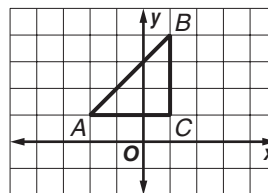
A $\frac{1}{3}$
 B $\frac{1}{2}$
 C 2
 D 3



8 _____

- 9 What are the coordinates of the vertices of the image of $\triangle ABC$ after a 90° clockwise rotation around the origin?

A $A'(2, 1), B'(-1, 4), C'(-1, 1)$
 B $A'(1, -2), B'(4, 1), C'(1, 1)$
 C $A'(1, 2), B'(4, -1), C'(1, -1)$
 D $A'(1, -1), B'(4, 1), C'(2, 1)$



9 _____

Standards Practice



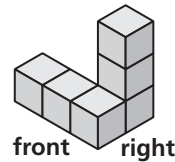
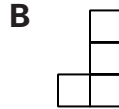
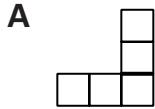
Objective 2.10



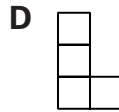
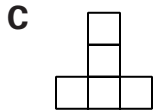
Identify and draw 3-dimensional figures from different perspectives (top, side, front, corner); use appropriate technology.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

1 Which is the front view of the 3-dimensional figure shown at the right?



1 _____



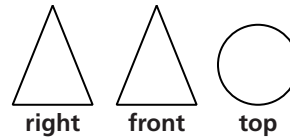
2 What kind of 3-dimensional figure could have these views?

A cylinder

B cone

C sphere

D triangular prism



2 _____

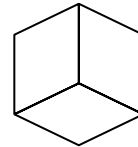
3 What kind of 3-dimensional figure could have a corner view like the one shown at the right?

A triangular prism

B square pyramid

C cube

D hexagonal prism



3 _____

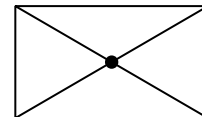
4 Which figure could have the top view shown at the right?

A rectangular prism

B rectangular pyramid

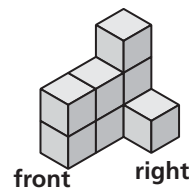
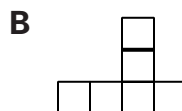
C triangular pyramid

D triangular prism

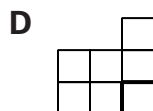
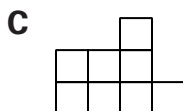


4 _____

5 Which is the right-side view of the 3-dimensional figure shown at the right?



5 _____



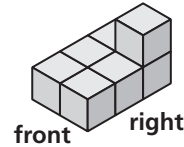
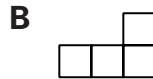
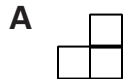
Standards Practice

Objective 2.10 (continued)

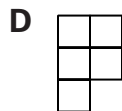
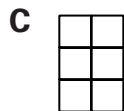


Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 6 Which is the front view of the 3-dimensional figure shown at the right?



6 _____

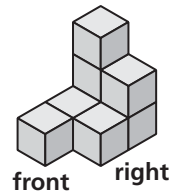
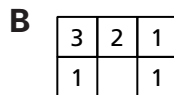
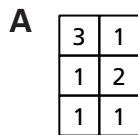


- 7 If you put one end of a cylinder on a table and sketch a side view of the cylinder, what kind of figure will you get?

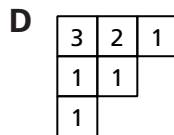
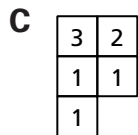
- A** circle
B rectangle
C trapezoid
D triangle

7 _____

- 8 You can give instructions for building a figure from cubes by drawing a top view of the figure and writing numbers in the squares to tell how many cubes to stack in each position. Which figure shows correct instructions for building the 3-dimensional figure shown at the right?



8 _____



- 9 All views of a 3-dimensional figure are a circle. What kind of figure is it?

- A** cylinder
B sphere
C prism
D pyramid

9 _____

Standards Practice

Objective 2.11 (continued)



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 6 What kind of 3-dimensional figure do you get by spinning the shaded figure around line ℓ ?

A cone
B cylinder
C pyramid
D prism



6 _____

- 7 What kind of 3-dimensional figure do you get by spinning the shaded figure around line ℓ ?

A cone
B prism
C pyramid
D cylinder



7 _____

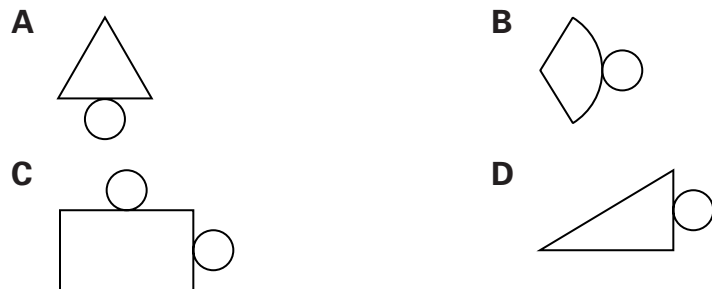
- 8 What kind of 3-dimensional figure do you get by spinning the shaded figure around line ℓ ?

A prism
B cylinder
C sphere
D cone



8 _____

- 9 Which pattern could you cut out and fold to make a cone?



9 _____

- 10 How many vertices are there for a pentagonal prism?

A 5
B 10
C 12
D 15

10 _____

- 11 You want to draw a pattern that can be cut out and folded to make a right triangular prism. What are the kinds and numbers of figures you must have in the pattern you draw?

A 3 rectangles, 2 triangles
B 3 rectangles, 3 triangles
C 2 rectangles, 2 triangles
D 2 rectangles, 3 triangles

11 _____

Standards Practice

Objective 2.12



Select appropriate units and tools for measurement tasks within problem-solving situations; determine precision and check for reasonableness of results.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1** If the smallest distance between the marks on an inch ruler is $\frac{1}{8}$ inch, what is the greatest possible error for a measurement that you make with the ruler? **1** _____

A $\frac{1}{32}$ in. **B** $\frac{1}{16}$ in. **C** $\frac{1}{8}$ in. **D** $\frac{1}{4}$ in.

- 2** Suppose you are using a metric ruler that is marked in centimeters and millimeters. What is the greatest possible error in measuring a segment length with the ruler? **2** _____

A 0.5 mm **B** 1 mm **C** 0.5 cm **D** 1 cm

- 3** Lalo used an inch ruler to measure the lengths of the sides of a quadrilateral. The closest marks on the ruler were $\frac{1}{8}$ inch apart. He added the lengths of the sides to find the perimeter of the quadrilateral. If he measured carefully and did the arithmetic correctly, what is the greatest possible error for the perimeter he calculated? **3** _____

A $\frac{1}{16}$ in. **B** $\frac{1}{8}$ in. **C** $\frac{1}{4}$ in. **D** $\frac{1}{2}$ in.

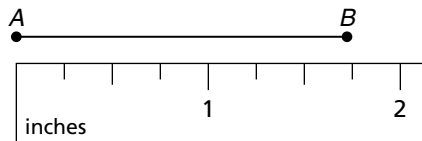
- 4** A chemist has a graduated cylinder with marks on the side that allow him to measure the volume of a liquid in the cylinder. The marks on the side of the cylinder are spaced to indicate volumes that differ by 0.1 milliliters. What is the greatest possible error in a volume measurement obtained by using the cylinder? **4** _____

A 0.05 mL **B** 0.1 mL **C** 0.2 mL **D** 0.5 mL

- 5** What is the length of segment AB to the nearest $\frac{1}{4}$ inch? **5** _____

A $1\frac{1}{2}$ in. **B** $1\frac{3}{4}$ in.

C $1\frac{11}{16}$ in. **D** 2 in.



Standards Practice

Objective 2.12 (continued)

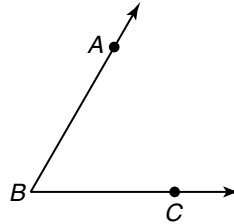


Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

For Questions 7 and 8, use your protractor.

- 6 What is the measure of $\angle ABC$ to the nearest degree?

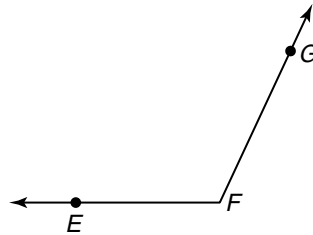
A 50
B 55
C 58
D 60



6 _____

- 7 What is the measure of $\angle EFG$ to the nearest degree?

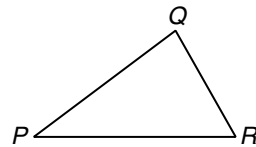
A 110
B 115
C 118
D 120



7 _____

- 8 Suppose you use your protractor to measure each angle of the triangle shown at the right. You then add the measures you obtain to find the sum of all the angle measures. What is the greatest possible error in the total you obtain?

A 0.5
B 1.0
C 1.5
D 2.0



8 _____

- 9 If you use your protractor to measure the angles of a pentagon and then add to find the total of the measures, what is the greatest possible error in the total?

A 0.5
B 0.75
C 2.0
D 2.5

9 _____

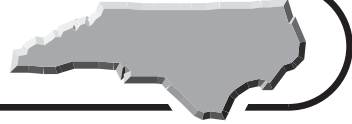
- 10 Suppose you want to measure the length of a segment to get a measurement with a greatest possible error of $\frac{1}{32}$ inch. How close must the closest marks on the ruler be to one another?

A $\frac{1}{64}$ in.
B $\frac{1}{32}$ in.
C $\frac{1}{16}$ in.
D $\frac{1}{8}$ in.

10 _____

Standards Practice

Objective 3.01 (continued)



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 6** The simple interest I that you earn by investing P dollars for t years at an annual interest rate of 5% can be calculated by using the formula $I = 0.05Pt$. Suppose you invest \$600 for 4 years at an annual interest rate of 5%. How much interest will you have earned by the end of the 4 years?

6 _____

- A \$12
- B \$30
- C \$120
- D \$300

- 7** Chandra drove from her house in Raleigh to a friend's house in Georgia. She drove at an average speed of 57 miles per hour. How far was she from home after 1.5 hours? Use the formula $d = rt$, where d is the distance you drive in t hours if your speed is r miles per hour.

7 _____

- A 90 mi
- B 85.5 mi
- C 82.5 mi
- D 80 mi

- 8** Use the formula $P = 2\ell + 2w$ to find the perimeter P of a rectangular garden with a length ℓ of 8 yards and a width w of 7 yards.

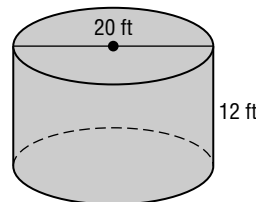
8 _____

- A 22 yd
- B 23 yd
- C 30 yd
- D 60 yd

- 9** Select an appropriate formula from the formula sheet and use it to calculate the surface area of the cylinder shown at the right. Use 3.14 for π . Round the answer to the nearest square foot.

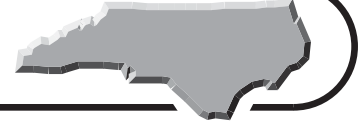
9 _____

- A 314 ft^2
- B 754 ft^2
- C $1,257 \text{ ft}^2$
- D $1,382 \text{ ft}^2$



Standards Practice

Objective 3.02



Solve one and two-step linear equations and inequalities.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1** Libby plans to make candles at home to sell at craft shows. Her cost for making the candles is \$0.60 per candle. She plans to sell the candles for \$4.10 each. Libby feels that she must make at least \$420 monthly at the craft shows to make the activity worthwhile. Which is the best description of the number of candles she must sell? **1** _____
- A** at least 700 candles **B** at least 120 candles
C at least 103 candles **D** at least 90 candles
- 2** Solve the inequality $-3x - 8 > 40$. **2** _____
- A** $x < -16$ **B** $x > -16$
C $x > 48$ **D** $x < 48$
- 3** North Carolina is a major source of livestock in the United States. In 2001, the cash value of turkeys was \$5,962 million. This was \$919 million more than 3 times the cash value of broiler chickens. What was the cash value of broilers in 2001? **3** _____
- A** \$6,881 million **B** \$5,043 million
C \$2,294 million **D** \$1,681 million
- 4** What is the solution of $50 = 8.5n - 6.95$? **4** _____
- A** 4.3 **B** 6.7
C 56.95 **D** 484.075
- 5** What would be the best first step in solving $-12x + 5 = 23$? **5** _____
- A** Divide each side by 12. **B** Divide each side by -12 .
C Subtract 5 from each side. **D** Add 5 to each side.
- 6** Solve $5x > -3x + 84$. **6** _____
- A** $x < -42$ **B** $x > 42$
C $x > 10\frac{1}{2}$ **D** $x < 10\frac{1}{2}$
- 7** Solve $3x + 5 > 3x + 7$. **7** _____
- A** $x < -2$ **B** $x > 2$
C $x > -2$ **D** no solution

Standards Practice

Objective 3.02 (continued)

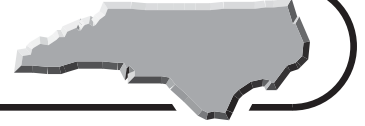


Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 8** Karla drove 198 miles in 3.6 hours. What was her average speed for the trip? **8** _____
A 65 mi/h **B** 62 mi/h
C 60 mi/h **D** 55 mi/h
- 9** Salvador has 9 days to read a 216-page book for a book report. To find the least number of pages he needs to read per day, he used p for the least number of pages necessary and solved the inequality $9p \geq 216$. Which inequality gives the least number of pages he should read each day? **9** _____
A $p \geq 24$ **B** $p \leq 24$
C $p \geq 28$ **D** $p \leq 107$
- 10** What is the solution of $8m = 36$? **10** _____
A 28 **B** $4\frac{1}{2}$ **C** $\frac{2}{9}$ **D** -28
- 11** Solve $\frac{x}{-7} \leq 6$. **11** _____
A $x \geq -42$ **B** $x \leq -42$
C $x \geq 42$ **D** $x \leq 42$
- 12** Solve $\frac{2}{5}y - 9 = 12$. **12** _____
A $7\frac{1}{2}$ **B** 15 **C** 21 **D** $52\frac{1}{2}$
- 13** Solve $-30 < \frac{2}{3}x + 6$. **13** _____
A $-24 > x$ **B** $-24 < x$
C $-54 < x$ **D** $-54 > x$
- 14** Solve $7x + 24 = x$. **14** _____
A -6 **B** -4 **C** 4 **D** 6
- 15** Solve $-19x + 15 = -4x$. **15** _____
A -1 **B** $-\frac{15}{23}$ **C** $\frac{15}{23}$ **D** 1

Standards Practice

Objective 3.03



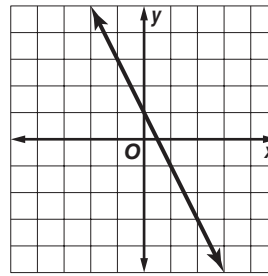
Graph a linear equation using ordered pairs. Investigate the graphs of linear inequalities; use appropriate technology.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 Which are the coordinates of two points on the graph of $3x - 5y = 15$? 1 _____
- A** $(-5, 0)$ and $(-3, 0)$ **B** $(5, 0)$ and $(0, -3)$
C $(0, -3)$ and $(0, 5)$ **D** $(5, 0)$ and $(10, 2)$

- 2 Which equation has the graph shown at the right? 2 _____

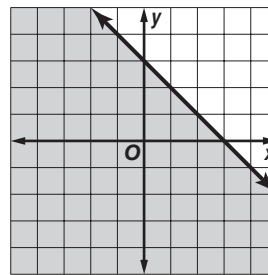
- A** $y = 2x + 1$
B $y = 2x - 1$
C $y = -2x + 1$
D $y = -2x - 1$



- 3 Which are the coordinates of a point that belongs to the graph of $y > \frac{3}{2}x + 6$? 3 _____
- A** $(6, 16)$ **B** $(4, 12)$
C $(5, 7)$ **D** $(-6, -4)$

- 4 The graph at the right shows the solutions of which inequality? 4 _____

- A** $y > -x + 3$
B $y \leq -x + 3$
C $y \geq x - 3$
D $y < -x - 3$

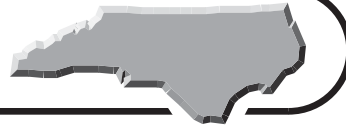


- 5 Which equation has a graph that is parallel to the x -axis? 5 _____
- A** $x = y$ **B** $y = -x$
C $x = -3$ **D** $y = 7$

- 6 Which inequality has a graph that includes all of Quadrant III of the coordinate plane? 6 _____
- A** $y < -x - 5$ **B** $y > x - 5$
C $y < -x + 2$ **D** $y > x + 5$

Standards Practice

Objective 3.03 (continued)



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

7 Which equation has a graph that goes through the point with coordinates $(4, -5)$? 7 _____

A $x + y = -9$

B $x - y = 9$

C $-x + y = 9$

D $y - 9 = x$

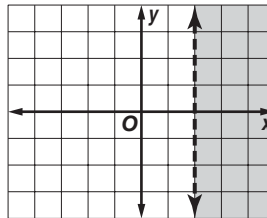
8 Which inequality has the graph shown at the right? 8 _____

A $y \leq 2$

B $y > 2$

C $x > 2$

D $x \leq 2$



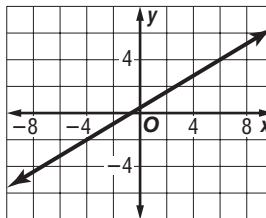
9 Which equation has the graph shown at the right? 9 _____

A $3x - 5y = -2$

B $3x + 5y = -2$

C $2x - 5y = 3$

D $2x + 5y = -3$



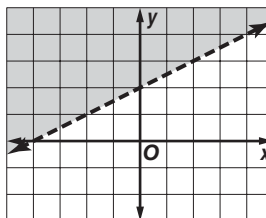
10 Which inequality has the graph shown at the right? 10 _____

A $2y - x > 4$

B $2y - x \leq 4$

C $y - 2x \leq 4$

D $y - 2x > 4$



11 The point with coordinates $(5, 7)$ belongs to the graph of which inequality? 11 _____

A $x + 2y < 18$

B $2x + y < 18$

C $x + y \leq -1$

D $2x - y \leq -1$

12 Which equation has a graph that passes through the points with coordinates $(-5, 3)$ and $(-1, 0)$? 12 _____

A $y = -\frac{3}{4}x - \frac{3}{8}$

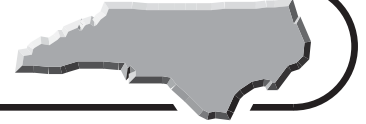
B $y = -\frac{3}{4}x + \frac{3}{8}$

C $y = \frac{3}{4}x - \frac{3}{4}$

D $y = -\frac{3}{4}x - \frac{3}{4}$

Standards Practice

Objective 3.04

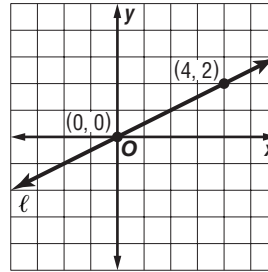


Investigate the concept of slope; use appropriate technology.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 What is the slope of the line ℓ shown in the graph at the right?

A $-\frac{1}{2}$
 B $\frac{1}{2}$
 C 2
 D 4



1 _____

- 2 What is the slope of the line that passes through the points with coordinates $(0, 4)$ and $(1, 7)$?

A -3
 B -1
 C 1
 D 3

2 _____

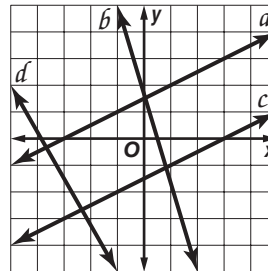
- 3 Suppose line m has slope a and line n has slope b . Which statement is true?

A If $a > b$, then line m is steeper than line n .
 B If $a < b$, then line n is steeper than line m .
 C If $|a| > |b|$, then line m is steeper than line n .
 D If $a = -b$, then lines m and n are perpendicular.

3 _____

- 4 Refer to the graph at the right. Which pair of lines have the same slope?

A lines a and b
 B lines b and c
 C lines c and d
 D lines a and c



4 _____

- 5 Which of the equations has a graph for which the slope is undefined?

A $x = 4$
 B $y = -4$
 C $x = y$
 D $y = -x$

5 _____

Standards Practice

Objective 3.04 (continued)



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 6** Which fraction shows a correct way to calculate the slope of the line that passes through the points with coordinates (4, 13) and (6, 20)? **6** _____

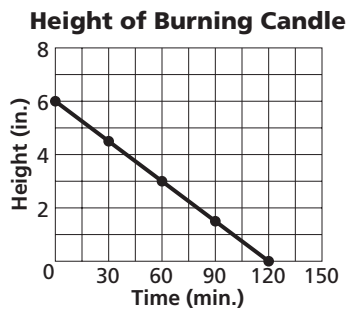
A $\frac{20 - 13}{6 - 4}$

B $\frac{20 - 13}{4 - 6}$

C $\frac{6 - 4}{20 - 13}$

D $\frac{20 - 4}{6 - 13}$

- 7** Eduardo lit a new candle that was 6 inches tall. He measured the height of the candle every 30 minutes until the candle burned out. He made the graph shown at the right to report the results. What does the slope of the graph tell you?



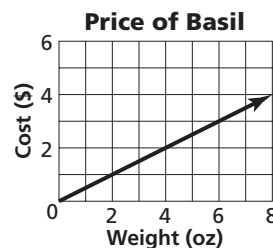
7 _____

- A** how tall the candle was when it was lit
B the change in the height of the candle per minute
C how tall the candle was after 2 hours
D how many minutes it took the candle to burn out

- 8** Points E , F , G , and H are four different points. If slope $EF = \text{slope } FG = \text{slope } GH$, which statement is true? **8** _____

- A** The points are in different quadrants.
B The points are in the same quadrant.
C The points lie on the same line.
D The points are the corners of a square.

- 9** The graph shows what a farmer in the Appalachian mountains charges for fresh basil. What does the slope of the graph tell you?

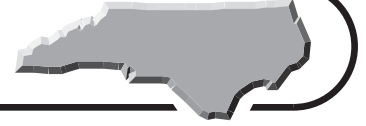


9 _____

- A** how much basil a typical customer buys
B how much basil she sold this week
C how much she makes per day on basil
D how much per ounce she charges for basil

Standards Practice

Objective 3.05



Describe, extend, and analyze a wide variety of geometric and numerical patterns, such as Pascal's triangle or the Fibonacci sequence; use appropriate technology.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 Find the next two numbers in the following number pattern. 1 _____

2, 8, 32, 128, ...

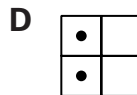
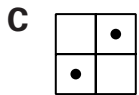
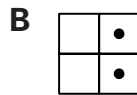
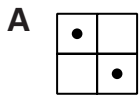
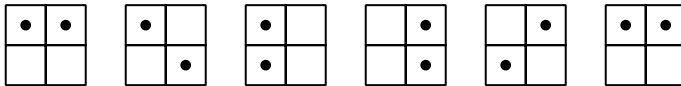
- A 256 and 512 B 512 and 2,048
C 512 and 4,096 D 2,048 and 8,192

- 2 Which rule tells how to get the numbers in the following pattern? 2 _____

-4, -1, 2, 5, 8, 11, ...

- A Start with -4, then add 3 to get the next number.
B Subtract 3 to get from one number to the next number.
C Multiply by $\frac{1}{4}$ to get from one number to the next number.
D Divide by -4 to get from one number to the next number.

- 3 Which figure comes next in the pattern? 3 _____



- 4 Gordon is trying to double the amount he earns each day. The table shows what his plan looks like. If he can stick to this plan, what will his total earnings be by the end of day 15?

- A \$32,767
B \$16,383
C \$8,191
D \$4,096

Day	Amount Earned that Day (\$)	Total Earned (\$)
1	1	1
2	2	3
3	4	7
4	8	15
5	16	31

4 _____

Standards Practice

Objective 4.01

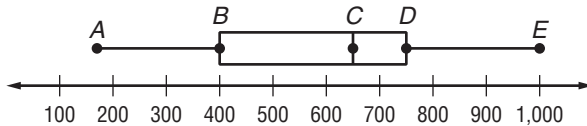


Interpret and construct box plots.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 Which of the following sets of data will give a box with no whiskers if you make a box-and-whisker plot? **1** _____
- A** 6, 6, 7, 7, 8, 8, 9, 9, 9, 9 **B** 6, 6, 6, 9, 9, 9, 9, 9, 9, 9, 9
- C** 6, 6, 6, 7, 7, 7, 9, 9, 9, 10 **D** 6, 7, 9, 9, 11, 9, 9, 9, 9, 9

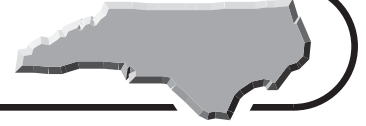
For Questions 2–6, refer to the box-and-whisker plot below.



- 2 The number corresponding to A is which of the following? **2** _____
- A** the median of the data **B** the least data value
- C** the first quartile **D** the third quartile
- 3 To find the range of the data, which of the following should you compute? **3** _____
- A** (number for D) – (number for C)
- B** (number for E) – (number for A)
- C** (number for D) – (number for B)
- D** (number for C) – (number for B)
- 4 The first quartile is closest to which number? **4** _____
- A** 600 **B** 500 **C** 400 **D** 200
- 5 The interquartile range can be found by calculating which of the following? **5** _____
- A** (number for D) – (number for A)
- B** mean of the numbers for B and D
- C** mean of the numbers for A and E
- D** (number for D) – (number for B)
- 6 The number for C is equal to which measure? **6** _____
- A** the median of the data set **B** the mean of the data set
- C** the mode **D** the third quartile

Standards Practice

Objective 4.02

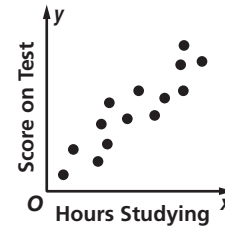


Collect data involving two variables and display on a scatter plot; interpret results; identify positive and negative relationships.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 What kind of correlation is shown by the scatter plot at the right?

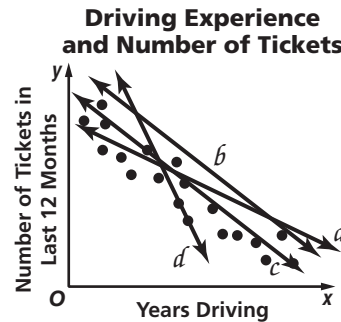
A positive correlation
 B weak negative correlation
 C no correlation
 D strong negative correlation



1 _____

- 2 Which of the lines in the scatter plot could be used as a line of fit?

A line *a*
 B line *b*
 C line *c*
 D line *d*



2 _____

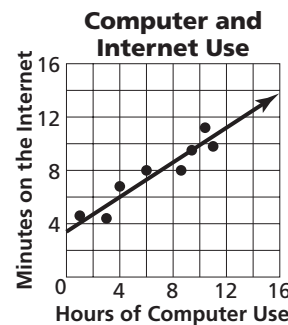
- 3 In which situation would you expect a scatter plot of the data gathered to show a negative correlation?

A the weight of an animal and the amount of food it eats each day
 B the number of cars in a city and the population of the city
 C the size of an airport and the number of flights that leave the airport each day
 D the age of a car and its resale value

3 _____

- 4 An office worker made the scatter plot at the right to show the number of hours he used his computer on different days and the number of minutes he was on the Internet. The equation of the line of fit that he drew is $y = 0.65x + 3.4$. Use the equation of the line of fit to predict how many minutes he would be on the Internet on a day when he uses his computer for 5 hours. Round to the nearest minute.

A 5 min B 6 min
 C 7 min D 8 min



4 _____

Standards Practice

Objective 4.02 (continued)



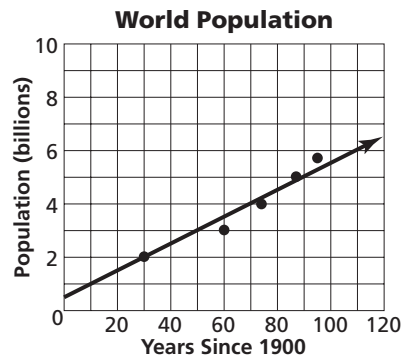
Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 5 A musical performer is on tour to promote her latest CD. What correlation would you expect to exist between the number of days on tour and the number of CDs sold?

A no correlation **B** positive correlation
C weak negative correlation **D** strong negative correlation

5 _____

For Questions 6–8, use the scatterplot at the right. It shows information about the estimated population of the world in five different years.



- 6 What kind of correlation does the scatter plot show?

A positive **B** negative
C inverse **D** no correlation

6 _____

- 7 The scatterplot shows a line of fit that has the equation $y = 0.057x + 0.0079$. If you use this equation, what prediction do you get for the world population in 2040?

A 12.5 billion **B** 11 billion **C** 10 billion **D** 8 billion

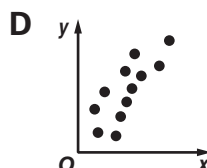
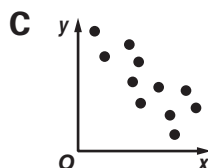
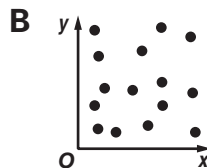
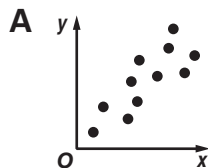
7 _____

- 8 Why would it not be a good idea to use the equation in Question 7 to predict the world population in 3000?

A The year 3000 is too far outside the range of years of the original data.
B It would be difficult to do the calculations using a large value of x .
C The population of the world has probably already stopped growing.
D Such a large value of x would require making a new graph.

8 _____

- 9 Which scatter plot shows no correlation?



9 _____

Standards Practice

Objective 4.03 (continued)

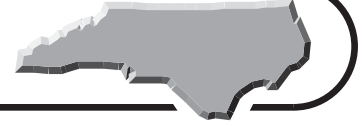


Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 7** The following data shows how many minutes several people spent on the Internet on a recent weekend. If you use the mean to represent the typical number of minutes they spent on the Internet, which number should you omit from the calculation and why? **7** _____
- 45 79 65 73 59 71 63 80 577 71 67 67
- A** Omit 45 since it is the least data value.
B Omit 67 since it occurs twice in the data set.
C Omit 577 since it is much larger than the other numbers.
D Omit 80 since all the other values are odd numbers.
- 8** The data below shows how many shares of stock Mr. Kranert owned during each of the last ten years in a certain company. Which measure gives the best idea of how many shares he owned in a typical year? **8** _____
- 20 20 24 27 28 30 30 32 75 75
- A** median
B mean
C mode
D third quartile
- 9** Which of the following does not have to be a number? **9** _____
- A** mean
B range
C median
D mode
- 10** In which set of data are there two numbers that have a large effect on the mean? **10** _____
- A** 58, 60, 59, 59, 58, 62
B 10, 13, 275, 270, 274, 271
C 2, 50, 51, 50, 52, 98
D 60, 93, 90, 94, 98, 98

Standards Practice

Objective 4.04



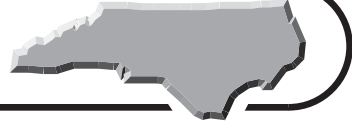
Evaluate arguments based on data. Discuss random vs. biased sampling.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1** When Tyler surveyed 10 students in the school cafeteria about their favorite movie of the past month, 75% of them named the same movie. That same week, a radio station reported on the top movies but did not mention the one that was first in Tyler's survey. Tyler decided that the radio report was not reliable. What is one thing wrong with his reasoning? **1** _____
- A** Tyler assumed that students remember what movies they have seen most recently.
- B** Tyler forgot that he used a very small sample that only included students in a narrow age range.
- C** Tyler did not do a second survey to see whether the students he originally sampled had seen the movies mentioned on the radio.
- D** Tyler probably talked to students instead of having them complete a written survey.
-
- 2** What is a key feature of a random sample of a population? **2** _____
- A** Each member of the population has an equal chance of being selected for the sample.
- B** All age groups are equally represented in the sample.
- C** A random sample always includes exactly the same number of males and females.
- D** The sample includes at least 25% of the total population.
-
- 3** A newspaper wants to see how people in the city and suburbs feel about enlarging the airport that is located in one of the suburbs. The paper asked a reporter to spend a day surveying people in that suburb to get their opinions. Why will this approach not give a fair picture of how the public feels about airport expansion? **3** _____
- A** The reporter may live in the suburb where the airport is located.
- B** The reporter may have personal opinions about the airport expansion.
- C** The sample for the survey will not be a random sample for the entire region.
- D** One day is not enough time to get a good sample of opinions.

Standards Practice

Objective 4.04 (continued)



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 4** A company makes bookshelves that customers assemble themselves. Recently the company has received complaints about missing screws that are necessary for proper assembly of the bookcases. The company randomly checks 50 of the bags of screws that are shipped with the bookcases and finds that six of the bags are missing one or two screws. Which is the best way to take care of this problem? **4** _____
- A** Stop selling the bookcases.
B Offer the bookcases at half price.
C Include three bags of screws with each set of bookshelves.
D Ask that three or four more screws go into each bag.
- 5** The two teachers who teach Spanish at a large high school asked their students to vote by secret ballot to see whether there is strong enough interest to merit starting a Spanish Club. The results showed that 68% of the students thought that a Spanish Club would be a good idea. What is the best reason for thinking there may be real interest in having a Spanish Club at the school? **5** _____
- A** The survey was a random survey of the students at the high school.
B The ballot was a secret ballot and well over 50% of the students said the club was a good idea.
C Students know that they will probably get a better grade in Spanish if they belong to such a club.
D Students are always in favor of having clubs that are related to the courses they are taking.
- 6** A company that manufactures electric toothbrushes advertises that 8 dentists out of 10 recommend its toothbrushes. Which would be the most helpful piece of information in evaluating this claim? **6** _____
- A** knowing the price of the toothbrush
B knowing the average number of patients that the dentists have
C knowing how many dentists were surveyed and how they were selected
D knowing how many years each of the dentists surveyed has been practicing dentistry

Standards Practice

Objective 4.05



Find the probability of independent and dependent events.

Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 What is the probability of flipping heads two times in a row when you flip a coin? **1** _____

A $\frac{1}{4}$

B $\frac{1}{2}$

C $\frac{3}{4}$

D 1

- 2 A bowl contains colored plastic cubes, all the same size. There are 3 blue, 7 red, and 5 yellow cubes. You draw a cube and record its color. You replace the cube, mix the cubes, and draw a second cube. What is the probability that the first cube is red and the second is blue? **2** _____

A $\frac{7}{5}$

B $\frac{2}{3}$

C $\frac{7}{75}$

D $\frac{1}{15}$

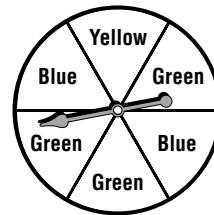
- 3 If you spin the spinner twice, what is the probability of spinning green and then yellow? **3** _____

A $\frac{1}{3}$

B $\frac{1}{4}$

C $\frac{1}{10}$

D $\frac{1}{12}$



- 4 A bowl contains 8 green marbles and 7 orange marbles. If the first marble you draw from the bowl is green and you do not replace it, what is the probability that the second marble you draw is orange? **4** _____

A $\frac{8}{15}$

B $\frac{1}{2}$

C $\frac{7}{15}$

D $\frac{1}{14}$

- 5 Courtney tosses three number cubes in the air and all three land with the number 5 showing. If she tosses the cubes again, what is the probability that she will get the same result? **5** _____

A $\frac{3}{6}$

B $\frac{3}{18}$

C $\frac{1}{215}$

D $\frac{1}{216}$

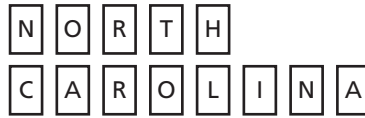
Standards Practice

Objective 4.05 (continued)



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

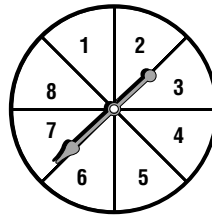
- 6** You write the letters of *North Carolina* on thirteen strips of paper, as shown in the figure. You put the strips in a bowl and mix them. Without looking, you draw two strips from the bowl. What is the probability that the strips you draw are the two that have the letter A?



6 _____

- A** $\frac{1}{78}$ **B** $\frac{1}{12}$
C $\frac{2}{13}$ **D** $\frac{37}{156}$

- 7** Suppose you spin the spinner twice. What is the probability that you get the number 3 on the first spin and do *not* get 3 on the second spin?



7 _____

- A** 1 **B** $\frac{7}{8}$
C $\frac{1}{8}$ **D** $\frac{7}{64}$

- 8** A newly married couple wants to have three children. If the probability of having a boy is the same as the probability of having a girl, what is the probability of having a boy, then a girl, then another girl?

8 _____

- A** $\frac{1}{16}$ **B** $\frac{1}{8}$
C $\frac{1}{4}$ **D** $\frac{1}{2}$

- 9** There are 200 good apples in a barrel and 250 bad apples. You take an apple from the barrel, do not replace it, and then take another apple from the barrel. Which expression represents the probability that both apples are good apples?

9 _____

- A** $\frac{200}{450} \cdot \frac{199}{449}$ **B** $\frac{200}{450} \cdot \frac{200}{450}$
C $\frac{200}{450} \cdot \frac{250}{450}$ **D** $\frac{199}{450} \cdot \frac{199}{449}$

- 10** The weather forecast says there is a 60% chance of rain today and a 50% chance of rain tomorrow. What is the probability that it rains both days?

10 _____

- A** 55% **B** 45%
C 30% **D** 20%

Sample Test

Test Practice



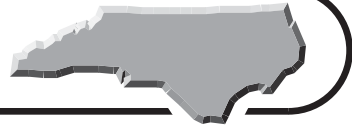
Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 1 Which number is irrational? 1 _____
- A $-\sqrt{25}$
B $-\sqrt{19}$
C $\sqrt{49}$
D $\sqrt{64}$
- 2 A year on the planet Neptune is equivalent to about 1.6481×10^2 Earth years. How is this time written in standard notation? 2 _____
- A 164.81 yr
B 16.481 yr
C 0.16481 yr
D 0.016481 yr
- 3 Write $(80x^{-4}y^7)\left(\frac{1}{4}x^9y^{-10}\right)$ in simplest form using only positive exponents. 3 _____
Assume that $x \neq 0$ and $y \neq 0$.
- A $\frac{20x^5}{y^3}$
B $20x^5y^3$
C $\frac{320y^{17}}{x^{13}}$
D $\frac{y^3}{20x^5}$
- 4 The planet Neptune is about 30 times farther from the sun than Earth. If Earth is about 9.3×10^7 miles from the sun, about how far is Neptune from the sun? Express the answer in standard notation. 4 _____
- A 27,900,000,000 mi
B 2,790,000,000 mi
C 279,000,000 mi
D 2,790,000 mi
- 5 What is the value of $|8 - 15| + |15 - 8|$? 5 _____
- A -14
B -7
C 7
D 14

Go on

Sample Test (continued)

Test Practice



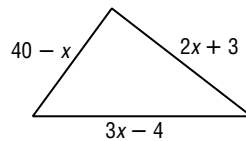
Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

6 If a number x has a multiplicative inverse, what number do you get when you multiply x by its multiplicative inverse? **6** _____

- A** 1 **B** 0 **C** x^2 **D** $-\frac{1}{x}$

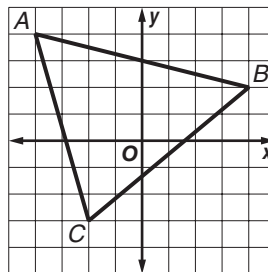
7 Which expression represents the distance around the triangle shown at the right? **7** _____

- A** $5x + 39$ **B** $4x - 37$
C $4x + 39$ **D** $6x + 47$



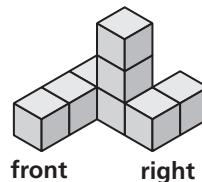
8 What are the coordinates of the vertices of $\triangle ABC$ after a dilation with respect to the origin that uses the scale factor $\frac{1}{2}$? **8** _____

- A** $A'(2, -2), B'(-2, -1), C'(1, 1.5)$
B $A'(-2, 2), B'(2, 1), C'(-1, -1.5)$
C $A'(-3.5, 4.5), B'(4.5, 2.5), C'(-1.5, -2.5)$
D $A'(-8, 8), B'(8, 4), C'(-4, -6)$

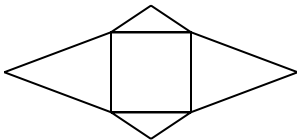
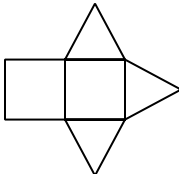
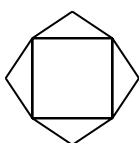
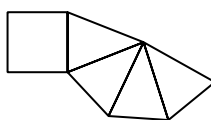


9 What is the front view of the solid figure shown at the right? **9** _____

- A**  **B** 
C  **D** 



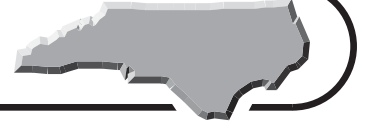
10 Which pattern could you cut out and fold to make a pyramid? **10** _____

- A**  **B** 
C  **D** 



Sample Test (continued)

Test Practice

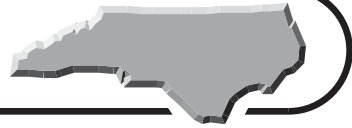


Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 11** Theodore uses a ruler to measure the sides of a triangle and then adds the lengths to find the perimeter of the triangle. If the closest marks on his ruler are $\frac{1}{16}$ inch apart, what is the greatest possible error in the perimeter that he calculates? **11** _____
- A** $\frac{1}{32}$ in. **B** $\frac{1}{16}$ in.
C $\frac{3}{32}$ in. **D** $\frac{3}{8}$ in.
- 12** If you add two rational numbers, the sum will always be what kind of number? **12** _____
- A** rational
B integer
C whole number
D irrational
- 13** The gas argon makes up, by volume, about 0.00934 of Earth's atmosphere. How is this number written in scientific notation? **13** _____
- A** 93.4×10^{-2}
B 9.34×10^{-3}
C 9.34×10^{-4}
D 9.34×10^{-5}
- 14** Simplify $(ab^3)^2 \cdot (a^5b)$. **14** _____
- A** a^6b^7
B a^7b^7
C a^5b^6
D a^5b^7
- 15** The mass of a proton is about 1.67×10^{-27} kilogram. The mass of an electron is about 9.11×10^{-31} kilogram. About how many electrons would it take to equal the mass of one proton? Round to the nearest hundred. **15** _____
- A** 2,500
B 2,200
C 2,000
D 1,800

Sample Test (continued)

Test Practice



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

16 What is the value of $\left|\frac{3}{-4}\right|$? _____

A $-\frac{3}{4}$

B $\frac{3}{-4}$

C $\frac{3}{4}$

D $-\frac{3}{4}$

17 Which property is illustrated by the equation $5 \cdot \frac{1}{5} = 1$? _____

A Commutative Property of Multiplication

B Associative Property of Multiplication

C Identity Property of Multiplication

D Inverse Property of Multiplication

18 Simplify $\frac{2a^2 - (a^2 - 1)}{1 + a^2}$. _____

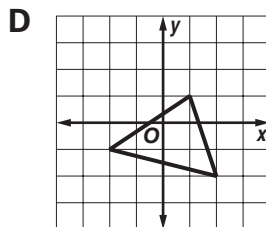
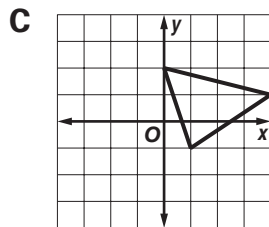
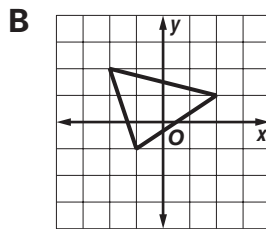
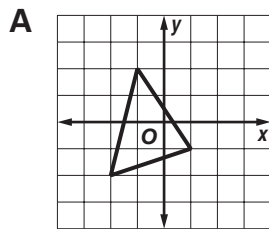
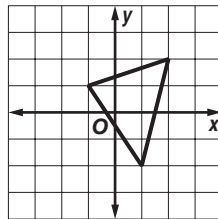
A a^2

B $-a^2$

C 1

D -1

19 Which of the following shows the image of the triangle shown at the right after a counterclockwise rotation of 270° around the origin? _____



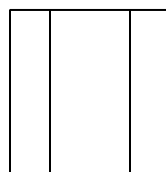
20 What figure could have the two views shown at the right? _____

A hexagonal pyramid

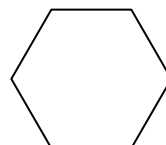
B hexagonal prism

C rectangular pyramid

D rectangular prism



right side



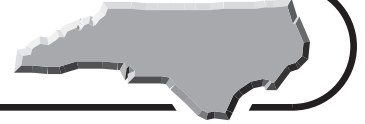
top

20 _____

Go on

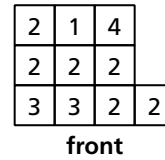
Sample Test (continued)

Test Practice

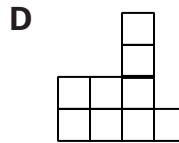
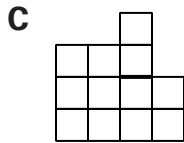
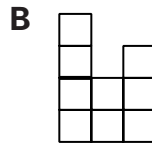
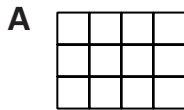


Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 21** A plan for a figure that will be built from cubes is shown at the right. The numbers in the squares indicate how many cubes are to be stacked in each location. What front view will you see after building the figure?



21 _____



- 22** Lavonda has a metal ruler with the closest marks spaced $\frac{1}{32}$ inch apart. If she uses the ruler to measure the length of a photo, what is the greatest possible error in the measure she obtains?

22 _____

- A** $\frac{1}{64}$ in. **B** $\frac{1}{32}$ in. **C** $\frac{1}{16}$ in. **D** $\frac{1}{8}$ in.

- 23** Which number is an irrational number?

23 _____

- A** $\sqrt{100}$ **B** $\sqrt{400}$ **C** $\sqrt{700}$ **D** $\sqrt{2,500}$

- 24** Which of the following statements is true?

24 _____

- A** $-24 > |-23|$ **B** $|-15| > 1$
C $|-24| < |-10|$ **D** $|-18| < 18$

- 25** Last year a student spent \$490 on books. This year she spent only \$450. What was the percent decrease in what she spent on books? Answer to the nearest tenth of a percent.

25 _____

- A** 8.2% **B** 8.9% **C** 81.6% **D** 88.9%

- 26** On a map of the United States, the distance from Fayetteville, North Carolina to Rocky Mount, North Carolina is about $\frac{11}{16}$ inch. The scale for the map is 1 inch = 125 miles. What is the approximate distance from Fayetteville to Rocky Mount?

26 _____

- A** 80 mi **B** 86 mi **C** 95 mi **D** 116 mi



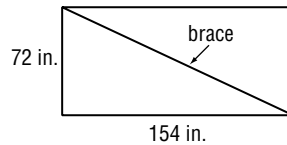
Sample Test (continued)

Test Practice



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

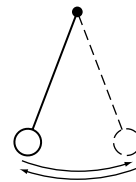
- 27** The walls of a tool shed are rectangles that have the measures shown in the figure. Manuel is going to strengthen each wall by adding a diagonal brace. How long will each brace be?



27 _____

- A** 226 in. **B** 190 in. **C** 180 in. **D** 170 in.

- 28** The formula $T = 2\pi\sqrt{\frac{L}{32}}$ gives the time T that it takes a pendulum of length L to make one complete swing from left to right and back. In the formula, T is measured in seconds, and L is measured in feet. Find the approximate time for one complete swing of a pendulum that is 2 feet long. Use 3.14 for π .



28 _____

- A** 3.14 s **B** 2.46 s **C** 2.13 s **D** 1.57 s

- 29** Which would be the best way to get a good mental estimate for the value of $246 \div 61$?

29 _____

- A** Round both numbers to the nearest multiple of 5.
B Round both numbers to the nearest 10.
C Use a pair of compatible numbers.
D Round to the nearest hundred.

- 30** Which is the least number in the list below?

30 _____

$-1, 1.001, -0.02, -\frac{11}{10}, 0.01\bar{2}$

- A** $0.01\bar{2}$ **B** -0.02
C $-\frac{11}{10}$ **D** -1

- 31** Between which two whole numbers is $\sqrt{125}$?

31 _____

- A** 11 and 12 **B** 12 and 13
C 13 and 14 **D** 14 and 15

- 32** Solve $9x + 30 = 5x$.

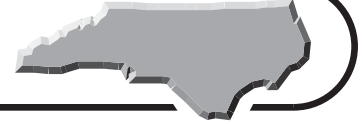
32 _____

- A** $7\frac{1}{2}$ **B** $2\frac{1}{7}$
C $-2\frac{1}{7}$ **D** $-7\frac{1}{2}$



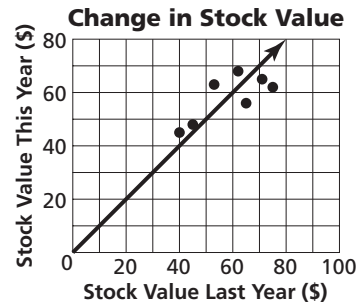
Sample Test (continued)

Test Practice



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 33** The scatter plot shows information about the value of a share of stock in each of seven companies last year and this year. The graph of $y = x$ is also shown. Which fact about the scatter plot best indicates that more of the stocks increased in value?



33 _____

- A** The scatter plot shows a positive correlation between the two sets of data.
B No two points of the scatter plot are on the same vertical line.
C More of the points of the scatter plot are above the graph of $y = x$.
D No two points of the scatter plot are on the same horizontal line.

- 34** What is $0.1\overline{6}$ written as a percent?

34 _____

- A** $\frac{2}{3}\%$ **B** 1.6%
C 10.6% **D** $16\frac{2}{3}\%$

- 35** Dr. Cho owns stock in four companies. The table shows information about the mean value of a share of each company's stock last year and this year. The number of shares he owned did not change. What additional information is most important in deciding whether Dr. Cho made money or lost money on his stock investments?

35 _____

Company	Mean Value of a Share Last Year (\$)	Mean Value of a Share This Year (\$)
A	48	52
B	65	79
C	36	33
D	52	54

- A** the percent increase or decrease in the value of each share
B the median percent change in the mean value of a share of stock
C the mean percent change in the value of a share of stock
D the number of shares he owned in each company

- 36** A triangle has side lengths 6 centimeters, 10 centimeters, and 15 centimeters. Which are the measures of the sides of a similar triangle?

36 _____

- A** 712 cm, 20 cm, 28 cm **B** 9 cm, 15 cm, 18 cm
C 18 cm, 30 cm, 45 cm **D** 24 cm, 40 cm, 70 cm



Sample Test (continued)

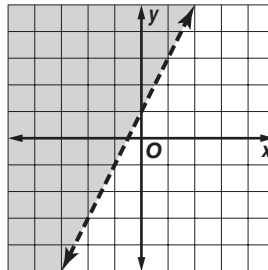
Test Practice



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

37 Which inequality is graphed at the right?

- A** $y > 2x + 1$
- B** $y \geq 2x - 1$
- C** $y \leq 2x + 1$
- D** $y > 2x - 1$



37 _____

38 A standard deck of cards has 52 cards. If 1,000 people, each with a standard deck, draw a single card at random from their deck, about how many people will draw a jack?

- A** 13
- B** 19
- C** 26
- D** 77

38 _____

39 A cylinder has a volume of 360 cubic inches. A cone has a base that is the same size as a base of the cylinder. The heights of the cylinder and the cone are the same. What is the volume of the cone?

- A** 120 in^3
- B** 90 in^3
- C** 72 in^3
- D** 60 in^3

39 _____

40 What is the value of $12\frac{3}{4} \div 2\frac{7}{8}$?

- A** $6\frac{6}{7}$
- B** $6\frac{21}{32}$
- C** $4\frac{10}{23}$
- D** $2\frac{16}{21}$

40 _____

41 For which set of data would it be most reasonable to use the mean to describe a typical data value?

- A** 9, 76, 74, 8, 75, 69, 64
- B** 12, 40, 63, 89, 125, 480, 500
- C** 70, 72, 71, 74, 3, 6, 10
- D** 58, 53, 54, 59, 55, 55, 57

41 _____

42 You want to make a rectangular box that can hold 140 cubic feet of sand. If the length of the box is to be 8 feet and the width is to be 7 feet, how deep should the box be?

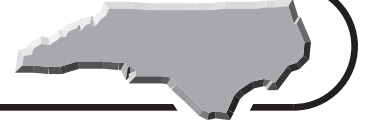
- A** 2 ft
- B** 2.5 ft
- C** 3 ft
- D** 3.5 ft

42 _____



Sample Test (continued)

Test Practice



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 43** If you double the radius of the base of a cone but keep the height of the cone the same, how will the volume of the cone change? **43** _____
- A** It will be multiplied by 2.
 - B** It will be multiplied by 4.
 - C** It will be multiplied by $\frac{4}{3}$.
 - D** It will be multiplied by 8.
- 44** Arno only goes to the movies on rainy days. If Arno wants to see a movie on a day when it is raining, he flips a coin. If the coin lands heads up, he goes to the movie, otherwise he does not. The weather forecast says there is a 40% chance of rain tomorrow. If there is a movie that Arno would like to see and tomorrow is the only day when he has enough time, what is the probability that he will see it tomorrow? **44** _____
- A** 10%
 - B** 20%
 - C** 30%
 - D** 40%
- 45** How is $10\frac{3}{8}\%$ written as a decimal? **45** _____
- A** 10.375
 - B** 1.0375
 - C** 0.10375
 - D** 0.010375
- 46** What is the tenth number in the pattern? **46** _____
- 1, 10, 11, 100, 101, 110, 111, ...
- A** 1,000
 - B** 1,010
 - C** 1,011
 - D** 1,111
- 47** The volume of a square pyramid is 100 cubic centimeters. A rectangular box has a base that is congruent to the base of the pyramid and a height that is equal to the height of the pyramid. What is the volume of the box? **47** _____
- A** 200 cm^3
 - B** 250 cm^3
 - C** 290 cm^3
 - D** 300 cm^3

Go on

Sample Test (continued)

Test Practice



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

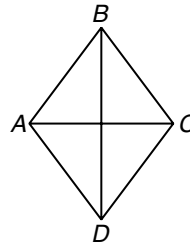
- 48 Mindy asked four classmates to flip a coin a certain number of times and to report how many times the result was heads. The table shows the results. What is a reasonable conclusion based on the data?

Number of Flips	Number of Heads
50	23
100	42
150	76
200	96
300	150

48 _____

- A The probability of getting heads is about 30%.
 B The probability of getting heads is about 50%.
 C It is impossible to get heads more than half the time.
 D It is impossible to get heads exactly half the time.

- 49 The diagonals of any rhombus are perpendicular to each other and bisect each other. If $ABCD$ is a rhombus for which AC is 6 feet and BD is 8 feet, what is the perimeter of $ABCD$?



49 _____

- A 20 ft
 B 24 ft
 C 30 ft
 D 40 ft

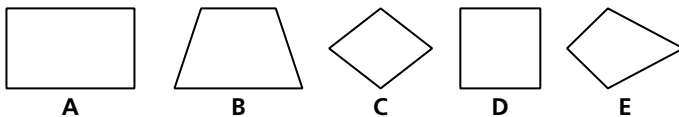
- 50 Lavonne got a 5% increase in salary after one year at a new job. She got another 5% increase at the beginning of her third year. If her original yearly salary was \$24,000, how much was her yearly salary after her second raise? Answer to the nearest ten dollars.

50 _____

- A \$25,200
 B \$26,460
 C \$27,780
 D \$29,172

- 51 Refer to the quadrilaterals shown below. Which two quadrilaterals have exactly one line of symmetry?

51 _____

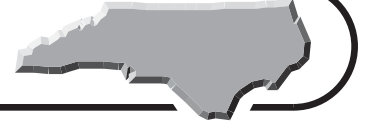


- A A and E
 B B and C
 C A and D
 D B and E



Sample Test (continued)

Test Practice



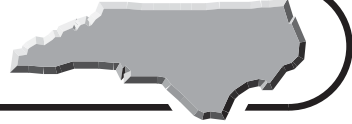
Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 52** A statue of Andrew Jackson is going to be placed on a granite base that is $4\frac{1}{2}$ feet long, 3 feet wide, and 2 feet tall. How many cubic feet of granite are used for the base of the statue? **52** _____
- A** 27 ft^3
B 24 ft^3
C 13.5 ft^3
D 9.5 cm^2
- 53** The quadrilateral $ABCD$ has its vertices at $A(-4, -3)$, $B(5, -3)$, $C(8, 4)$, and $D(2, 3)$. Which side of the quadrilateral has the greatest slope? **53** _____
- A** \overline{BC}
B \overline{CD}
C \overline{AD}
D \overline{AB}
- 54** The probability that a certain baseball player hits a ball that goes over the fence is 0.04. If the player is at bat 80 times, how many balls would you expect him to hit that go over the fence? **54** _____
- A** 1
B 3
C 5
D 7
- 55** Which of the following is closest to the value of $\sqrt{43}$? **55** _____
- A** 6.4
B 6.5
C 6.6
D 6.7
- 56** The length of a rectangular prism is doubled, its width is reduced by half, and its height is tripled. How does the volume of the new prism compare with the volume of the original prism? **56** _____
- A** It is 3 cubic units more than the original volume.
B It is 3 times the original volume.
C It is $1\frac{1}{2}$ cubic units more than the original volume.
D It is $1\frac{1}{2}$ times the original volume.

Go on

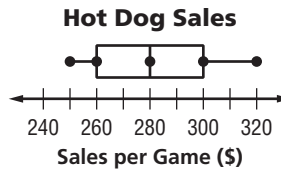
Sample Test (continued)

Test Practice



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

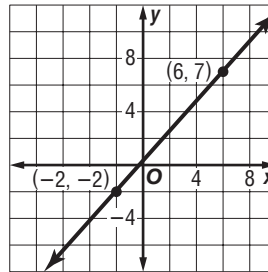
- 57** The box-and-whisker plot shows information about Leona's hot dog sales at last year's baseball games. What was the range of sales at the games?



57 _____

- A** \$320
B \$280
C \$70
D \$40

- 58** Which equation has the graph shown at the right?



58 _____

- A** $9x + 8y = 2$
B $9x + 8y = -2$
C $9x - 8y = 2$
D $9x - 8y = -2$

- 59** Chandra wants to know how many ways there are to make change for a \$5 bill using nickels, dimes, quarters, and \$1 bills. Which would be the best problem solving strategy for her to use?

59 _____

- A** Make a graph.
B Make an organized list.
C Write and solve an equation.
D Draw a diagram.

- 60** Randy keeps a record of how much money he spends eating out. The totals for the last three years are shown in the table. Which is the most reasonable conclusion based on the data in the table?

Year	Amount Spent
1	\$1,930
2	\$1,600
3	\$1,350

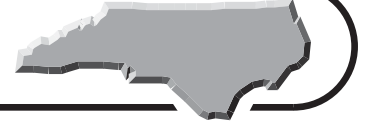
60 _____

- A** Randy's salary has been decreasing over the last three years.
B Randy has been reducing the amount he spends eating out.
C Randy does not eat out as often as he used to.
D Randy is eating at less expensive restaurants than before.



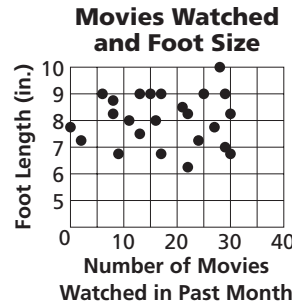
Sample Test (continued)

Test Practice



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

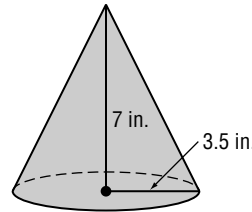
- 61** A math student surveyed a random sample of 25 people to gather data about the number of movies people have watched on TV or in a theater in the past month and their foot size. Her findings are shown in the scatter plot at the right. What is a reasonable interpretation of the results?



61 _____

- A** There seems to be no relationship between foot size and the number of movies watched.
- B** People with large feet watch more movies than people with small feet.
- C** People with small feet watch more movies than people with large feet.
- D** Everyone watches a movie on TV or in a theater each month.

- 62** What is the volume of the cone shown at the right? Use 3.14 for π . Round to the nearest tenth of a cubic inch.



62 _____

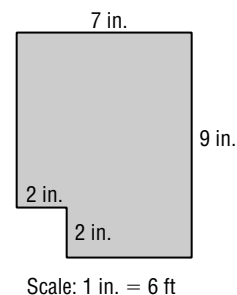
- A** 359.0 in^3
- B** 269.3 in^3
- C** 89.8 in^3
- D** 28.6 in^3

- 63** What is the slope of the graph of $3x - 5y = 10$?

- A** $\frac{3}{5}$
- B** 2
- C** 3
- D** $\frac{10}{3}$

63 _____

- 64** The scale drawing shows the dimensions of a room that a restaurant uses for large parties and groups. What is the actual area of the room?



64 _____

- A** $2,268 \text{ ft}^2$
- B** $2,124 \text{ ft}^2$
- C** $1,764 \text{ ft}^2$
- D** $1,620 \text{ ft}^2$



Sample Test (continued)

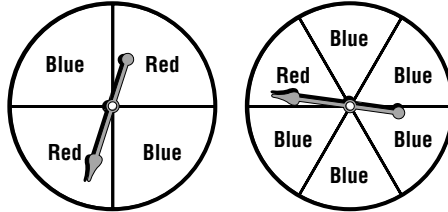
Test Practice



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 65 If you spin each of the spinners shown at the right, what is the probability of spinning blue on both?

A $\frac{4}{24}$ B $\frac{5}{24}$
 C $\frac{2}{5}$ D $\frac{2}{3}$



65 _____

- 66 A rectangular box containing ballpoint pens is $5\frac{1}{2}$ inches tall, $2\frac{7}{8}$ inches long, and $\frac{7}{8}$ inch wide. What is the surface area of the box to the nearest square inch?

A 46 in^2 B 50 in^2 C 54 in^2 D 56 in^2

66 _____

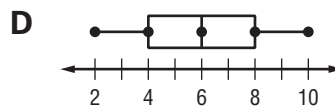
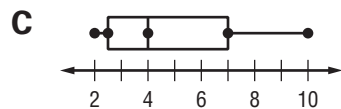
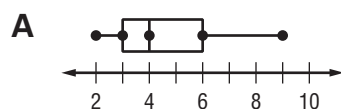
- 67 Solve $-5x \leq 2x + 21$.

A $x \leq -7$ B $x \leq -3$ C $x \geq -7$ D $x \geq -3$

67 _____

- 68 Which is a correct box-and-whisker plot for the following data.

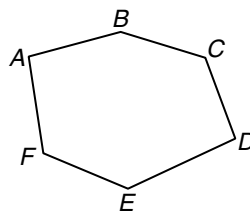
2, 2, 3, 4, 4, 4, 5, 10, 9



68 _____

- 69 What is the sum of the measures of the interior angles of the polygon shown at the right?

A 720 B 630
 C 540 D 450



69 _____

- 70 If there are only a few numbers in a set of data, which measure would be most likely to be greatly affected by a single data value that is much lower than all the other values?

A maximum value B median
 C third quartile D mean

70 _____



Sample Test (continued)

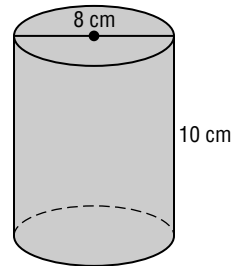
Test Practice



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

- 71** Find the surface area of the cylinder shown at the right. Use 3.14 for π . Round to the nearest tenth of a square centimeter.

A 351.7 cm²
B 251.2 cm²
C 100.5 cm²
D 98.7 cm²



71 _____

- 72** Look for a pattern in the values of x and y in the table at the right. What is the value of y when $x = 10$?

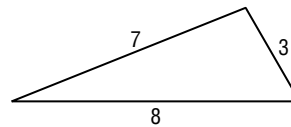
A 41
B 43
C 48
D 51

x	y
1	-2
2	3
3	8
4	13
5	18

72 _____

- 73** What are the side lengths of a triangle that is congruent to the triangle shown at the right?

A 3, 7, 8
B 6, 14, 16
C $1\frac{1}{2}$, $3\frac{1}{2}$, 4
D 30, 70, 80



73 _____

- 74** Wilfrido used a map and measured the distance from Durham, North Carolina to Morehead City, North Carolina as 3.1 centimeters. The scale for the map was 1 centimeter = 79.2 kilometers. What is the approximate distance from Durham to Morehead City? Round to the nearest kilometer.

A 220 km **B** 238 km
C 246 km **D** 256 km

74 _____

- 75** Find the value of $4\frac{3}{4} \div (-2\frac{1}{2})$.

A $-1\frac{21}{25}$
B $-1\frac{24}{25}$
C $11\frac{1}{2}$
D -12

75 _____



Sample Test (continued)

Test Practice



Read each question and choose the best answer. Then write the letter for the answer you have chosen in the blank at the right of each question.

76 What is the decimal for $1\frac{3}{8}\%$? **76** _____

- A 10.375
- B 1.375
- C 0.1375
- D 0.01375

77 An electronics store had a sale and offered a 30% discount on a computer. After the sale, the store increased the discount price by 25%. If the computer originally sold for \$860, what was the price after the increase in the discount price? **77** _____

- A \$752.50
- B \$817.00
- C \$845.50
- D \$855.00

78 Between which two consecutive whole numbers is $\sqrt{1,000}$? **78** _____

- A 29 and 30
- B 30 and 31
- C 31 and 32
- D 32 and 33

79 A student has an average of 88 on her math tests this month. She would like to score high enough on the next test to raise her average to 91. What additional information would allow you to say whether this is possible? **79** _____

- A her highest score so far
- B her lowest score so far
- C her median score
- D the number of tests so far

80 Sal has a piece of cardboard that is 13 inches high and 11 inches wide. He has photos of 25 classmates, and each photo is 3 inches high by 2 inches wide. What is the greatest number of photos he can mount on the cardboard without any overlap? **80** _____

- A 23
- B 22
- C 21
- D 20

