Preparation for the North Carolina End-of-Grade (EOG) Test Practice and Sample Test Workbook

Includes:

- 2003 North Carolina Course of Study Content Standards, Grade 8
- Student Recording Chart
- Diagnostic Test
- Numerous Practice Questions for Each Content Standard
- Full-Size Sample Test
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.
- 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.
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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 2003 North Carolina Content Standards, Grade 8,
• a Diagnostic Test,
• practice for each objective of the Content Standards, and
• a Sample Test.

How to Use This Book

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 × in the square for each question that you answered incorrectly.

Practice   If you missed one or two of the questions for a particular objective, you could probably use some extra practice with that objective. The Student Recording Chart lists practice pages for each objective. 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 the students have completed their Standards Practice worksheet(s), administer the Sample Test found on pages 87 to 102 in the Student Workbook.
**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 an objective, write *Yes* in the *Need Practice?* box. Then complete the practice pages for that objective.

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*North Carolina End-of-Grade Test, Grade 8*
# 2003 North Carolina Content Standards, Grade 8, Competency Goals and Objectives

## COMPETENCY GOAL 1: The learner will understand and compute with real numbers.

### 1.01 Develop number sense for the real numbers.
- (a) Define and use irrational numbers.
- (b) Compare and order.
- (c) Use estimates of irrational numbers in appropriate situations.

### 1.02 Develop flexibility in solving problems by selecting strategies and using mental computation, estimation, calculators or computers, and paper and pencil.

## COMPETENCY GOAL 2: The learner will understand and use measurement concepts.

### 2.01 Determine the effect on perimeter, area or volume when one or more dimensions of two- or three-dimensional figures are changed.

### 2.02 Apply and use concepts of indirect measurement.

## COMPETENCY GOAL 3: The learner will understand and use properties and relationships in geometry.

### 3.01 Represent problem situations with geometric models.

### 3.02 Apply geometric properties and relationships, including the Pythagorean theorem, to solve problems.

### 3.03 Identify, predict, and describe dilations in the coordinate plane.

## COMPETENCY GOAL 4: The learner will understand and use graphs and data analysis.

### 4.01 Collect, organize, analyze, and display data (including scatterplots) to solve problems.

### 4.02 Approximate a line of best fit for a given scatterplot; explain the meaning of the line as it relates to the problem and make predictions.

### 4.03 Identify misuses of statistical and numerical data.
### Competency Goals and Objectives

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| **5.01** Develop an understanding of function.  
(a) Translate among verbal, tabular, graphic, and algebraic representations of functions.  
(b) Identify relations and functions as linear or nonlinear.  
(c) Find, identify, and interpret the slope (rate of change) and intercepts of a linear relation.  
(d) Interpret and compare properties of linear functions from tables, graphs, or equations. |
| **5.02** Write an equation of a linear relationship given: two points, the slope and one point on the line, or the slope and y-intercept. |
| **5.03** Solve problems using linear equations and inequalities; justify symbolically and graphically. |
| **5.04** Solve problems using the inverserelationships of addition and subtraction, multiplication and division, squares and square roots, and cubes and cube roots. |
Diagnostic Test

**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 square root of 0.01?  
   - A 1  
   - B 0.1  
   - C 0.01  
   - D 0.001  

2. Kathy has three brothers: Allan, age 3; George, age 7; and Juan, age 8. If she doubles Allan’s age, subtracts Allan’s age from George’s age, and adds George’s age to Juan’s age, the sum of the three results equals her friend Aaron’s age. What is Aaron’s age?  
   - A 18 years  
   - B 22 years  
   - C 25 years  
   - D 30 years

3. Ms. Powell, from North Carolina, is commissioning a poll to see if she has any chance of winning the Presidency of the United States. Which answer provides her the best polling advice?  
   - A Ms. Powell needs to include some northern states in her poll.  
   - B It does not matter whom Ms. Powell polls; any sample will do.  
   - C A statistically random sample of the registered voters in the U.S. should be polled.  
   - D Ms. Powell should randomly select at least 20 states and poll their registered voters.

4. The data entries reflect the number of push-ups completed by Martha and six of her friends. The deletion of which data entry will have the greatest effect on the mean?  
   - A 40 push-ups  
   - B 55 push-ups  
   - C 57 push-ups  
   - D 127 push-ups

```
Martha: 40  
June: 127  
Shawna: 55  
Rosa: 61  
Kelli: 55  
Missy: 59  
Kena: 57
```

5. Two polygons are similar. Which of the following is always true?  
   - A The areas are different.  
   - B Corresponding angles are congruent.  
   - C The perimeters are equal.  
   - D The areas are equal.
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 Maddie owns a hog farm. She sends hogs to market in a ratio of 3 to 10 on Mondays and Tuesdays. If Maddie sent 333 hogs to market on Monday, how many did she send to market on Tuesday? 6 ________
A 111 hogs  B 666 hogs  C 777 hogs  D 1,110 hogs

7 Dan is building a silo on his farm in the shape of a right circular cylinder. If he were to increase the radius and height by a factor of 1.5, by what factor would the volume of the silo increase? 7 ________
A 1.5  B 2.25  C 3  D 3.375

8 Logan just bought a television and took it to his house at 1220 Fremont Street. Subtracting 100 from the result of both tripling his street address and dividing by 4 gives the amount he paid for the television. How much was it? 8 ________
A $815  B $915  C $1,015  D $3,560

9 The two trapezoids in the diagram are similar. Which of the following is the length of $HG$? 9 ________
A 5.89 centimeters  B 6.51 centimeters  C 10.6 centimeters  D 14.57 centimeters

10 What number can be cubed with the result being multiplied by 5 to get 625? 10 ________
A 625  B 125  C 25  D 5

Go on
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 A race track designer wants a circular track that is between 2 and 3 miles in circumference. The initial design had a radius of 0.15 mile, but was about 0.9 mile long. By what factor should the radius of the initial design be increased to achieve the desired track length? 2.01
A 2  B 3  C 4  D 5

12 Greg and Marty are standing next to one another. Marty is 5 feet 10 inches tall while George is 6 feet tall. George casts a shadow 15 feet long. How long is Marty’s shadow? 2.02
A 156 inches  B 168 inches  C 175 inches  D 185 inches

13 If rectangle $AB'C'D'$ is the image of rectangle $ABCD$ under a scale factor of $\frac{2}{3}$, what are the coordinates of $C'$? 3.03

14 Fredrico is riding his bicycle at a constant rate of 300 feet every 30 seconds. Which equation models Fredrico’s progress in feet per minute? 5.01
A $D = 600t + 300$  B $D = 600t$  C $D = 300t$  D $D = 300t - 600$

15 What is the range of the data? 4.03
5 feet 6 inches, 6 feet 1 inches, 6 feet 8 inches, 5 feet 2 inches, 4 feet 3 inches
A 80 inches  B 66 inches  C 51 inches  D 29 inches
Diagnostic Test (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.

16 Approximately what percent of the circle is shaded? 1.01
   A 90%
   B 40%
   C 25%
   D 20%

17 If a triangle is subjected to a dilation with scale factor \( k \), which of the following is always true? You may assume the value of \( k \) is greater than 0.
   A The perimeter of the triangle remains constant. 3.03
   B The sum of the measures of the three interior angles remains constant.
   C The area of the triangle remains the same.
   D There is not enough information to make a decision.

18 The formula for the area of a circle is \( A = \pi r^2 \). Which of the following represents \( \pi \) in terms of \( A \) and \( r \)? 5.04
   A \( \pi = \frac{A}{r^2} \)
   B \( \pi = Ar^2 \)
   C \( \pi = \sqrt{Ar} \)
   D \( \pi = \sqrt{Ar^2} \)

19 A rectangle with dimensions 10 feet by 3 feet has an area of 30 square feet. Increasing the length by a factor of 2 creates a second rectangle with an area of 60 square feet. Repeating this process 8 more times, each time increasing the length by successive factors of 2, what would be the area of the 10th rectangle? 4.02
   A 15,360 square feet
   B 9,720 square feet
   C 3,720 square feet
   D 540 square feet

20 Sean lives at point \( F \). His best friend Mike lives at point \( A \). If each segment represents two miles, approximately how far in a straight line does Sean live from Mike? 3.01
   A 10 miles
   B 4.5 miles
   C 3 miles
   D 2.5 miles
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 If Juanita increases the length of the longest side of her backyard garden by a factor of 2.1, by what factor will the area of Juanita’s entire garden increase?  

\[ \text{A} \quad 176.4 \quad \text{B} \quad 4.41 \quad \text{C} \quad 2.1 \quad \text{D} \quad 1.2 \]

22 Graph the following coordinates and determine the type of correlation. 

\{(-3, 4), (-2, 2), (-1, 2), (0, 1), (1, -1), (2, -2)\}  

\[ \text{A} \quad \text{negative correlation} \quad \text{B} \quad \text{positive correlation} \quad \text{C} \quad \text{no correlation} \quad \text{D} \quad \text{slightly positive correlation} \]

23 If \( f(x) = -7x + (-11) \), what is \( f(-4) \)?  

\[ \text{A} \quad -39 \quad \text{B} \quad -17 \quad \text{C} \quad 17 \quad \text{D} \quad 39 \]

24 Which of the sets of triples is not a Pythagorean Triple?  

\[ \text{A} \quad \{20, 21, 28\} \quad \text{B} \quad \{8, 15, 17\} \quad \text{C} \quad \{9, 40, 41\} \quad \text{D} \quad \{3, 4, 5\} \]

25 Why does the data in the table not represent a function?  

\[ \begin{array}{c|cccc} \text{Domain} & \frac{1}{2} & -2 & 1 & \frac{1}{8} & 1 \\
\hline \text{Range} & 0 & 4 & -5 & 4 & -2 \end{array} \]

\[ \text{A} \quad \text{A function cannot have fractions in its domain.} \\
\text{B} \quad \text{The domain element 1 is assigned two different range elements, \(-5\) and \(-2\).} \\
\text{C} \quad \text{Two different domain elements, \(-2\) and \(\frac{1}{8}\), each are paired with the same range element, 4.} \\
\text{D} \quad \text{It does represent a function.} \]
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.

26 Rodney has finished 80% of a 100 problem assignment. Vela has finished 60% of what Rodney has finished, Matt has finished 2 more problems then Vela, and Tawana has finished 40% of what Matt has finished. How many problems has Tawana finished? 1.02

A 50 problems
B 42 problems
C 20 problems
D 18 problems

27 The equation \( F = 5P + 30 \) is used to calculate the yearly membership fee \( F \), for Milo’s running club. \( P \) is the number of practices attended each year. Which answer reflects the purpose of the coefficient of \( P \)?

A the price for a bottle of water
B the vertical intercept
C the one time yearly fee
D the fee per practice

28 Using the equation from Question 27, what does the 30 represent? 5.01

A the horizontal intercept
B the fixed annual fee
C the fee per practice
D after-practice snacks

29 Benita is planning a party for 70 guests, including herself. She has two rectangular tables, each seating 8 people. The round tables have room for 6 people. How many round tables does Benita need? 5.04

A 14 round tables
B 13 round tables
C 10 round tables
D 9 round tables

30 The data show the number of passes attempted and completed by four football quarterbacks. Which quarterback was the most successful, considering the percentage of passes completed? 4.01

<table>
<thead>
<tr>
<th>Team</th>
<th>Quarterback</th>
<th>Passes Attempted</th>
<th>Passes Completed</th>
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<tbody>
<tr>
<td>Storm</td>
<td>Marino</td>
<td>400</td>
<td>296</td>
</tr>
<tr>
<td>Canes</td>
<td>Elway</td>
<td>321</td>
<td>215</td>
</tr>
<tr>
<td>Wind</td>
<td>Differ</td>
<td>211</td>
<td>110</td>
</tr>
<tr>
<td>Fire</td>
<td>Johnson</td>
<td>199</td>
<td>98</td>
</tr>
</tbody>
</table>

A Marino
B Elway
C Differ
D Johnson
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.

31 Which is the least number? \(1.01\)
\(-1, \sqrt{2}, 0.003, -0.003, -13, 0\)
A 0.003 B 0
C -0.003 D -13

32 The table shows the price per share of stock in the Acme Cotton Company during one week. If the trend continues, what is the likely approximate price per share at the close of the stock market five business days later on the following Friday? \(4.02\)

<table>
<thead>
<tr>
<th>Day</th>
<th>Mon.</th>
<th>Tues</th>
<th>Wed.</th>
<th>Thurs</th>
<th>Fri.</th>
</tr>
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<tbody>
<tr>
<td>Price per Share</td>
<td>$2.75</td>
<td>$2.76</td>
<td>$2.80</td>
<td>$2.79</td>
<td>$2.85</td>
</tr>
</tbody>
</table>
A $3.55 B $3.21
C $2.95 D $2.85

33 If the data \(\{15, 17, 20, 20, 23\}\) represent the number of arm curls Courtney has done in five successive weeks, which of the following would be an unreasonable number of arm curls for Courtney during the eighth week? \(4.02\)
A 32 arm curls B 29 arm curls
C 26 arm curls D 25 arm curls

34 The scale on a map is 1 inch equals 20 miles. How far apart are Greensboro and Rockingham if they are \(4\frac{1}{2}\) inches apart on the map? \(2.02\)
A 80\(\frac{1}{2}\) miles B 90 miles
C 100 miles D 120 miles

35 Cornita needed a box to carry 6 cans of lemonade back to her friends from the concession stand at an outdoor concert. If each circular can has a diameter of 3 inches, which open box will hold all 6 cans as shown? \(3.01\)
A 10 inches by 7 inches B 15 inches by 3 inches
C 12 inches by 4 inches D 8 inches by 4 inches
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.

36  A right triangle has a base measuring 5 centimeters and a height of 12 centimeters. By what amount will the area of this triangle increase if both the base length and the height are tripled?  2.01
   A  240 square centimeters     B  270 square centimeters
   C  480 square centimeters     D  540 square centimeters

37  If Pana, age 11, subtracts 2 from twice her age, then squares the result, Pana will have the number of video tapes she owns. How many tapes does she own?  5.03
   A  400 tapes     B  200 tapes
   C  81 tapes     D  20 tapes

38  On graph paper, plot the six ordered pairs. Which two ordered pairs would be best to use in creating a line of best fit for this data?  4.01
   (0, 3), (1, –4), (–2, 0), (3, 0), (–5, 5), (4, –4)
   A  (0, 3), (1, –4)     B  (–5, 5), (4, –4)
   C  (–2, 0), (3, 0)     D  (–2, 0), (4, –4)

39  What is the area of the trapezoidal placemat shown in the figure?  3.01
   A  144 square inches
   B  216 square inches
   C  288 square inches
   D  432 square inches

40  Which is an equation of the line with slope 2 and y-intercept 6?  5.02
   A  \( y = 2x - 6 \)     B  \( y = 6x + 2 \)
   C  \( 2x + 6y = 1 \)     D  \( y = 2x + 6 \)

41  Two thousand feet away from the top of a mountain peak in the Great Smoky Mountains is a second peak. A third peak, which forms a right triangle with the other two peaks, is 5,000 feet from the first. If the first and third peaks form the hypotenuse of the right triangle, about how far is the second peak from the third?  3.02
   A  7,000 feet     B  4,600 feet
   C  3,600 feet     D  3,000 feet
42 What is the next number in the pattern? **1.02**  
4, 16, 36, 64, 100, 144  
A 52  
B 121  
C 169  
D 196  
42 ________

43 What remains constant in a dilation with scale factor 1? **3.03**  
A Under a dilation everything either gets bigger or smaller.  
B Under a dilation with scale factor of 1, everything stays the same.  
C There is no such thing as a dilation with scale factor of 1.  
D Under a dilation with scale factor 1, only distance is preserved.  
43 ________

44 Which geometric figure models the path of a basketball shot? **3.01**  
A  
B  
C  
D  
44 ________

45 Which could be the image of △XYZ under a dilation of magnitude 2? **3.03**  
A  
B  
C  
D  
45 ________
46 The length of the rectangle is approximately twice the width. What is a reasonable approximation for the length and width of the rectangle?  

A. \( L = 12 \text{ units}, \ W = 6 \text{ units} \)  
B. \( L = 6.2 \text{ units}, \ W = 5.8 \text{ units} \)  
C. \( L = 8.5 \text{ units}, \ W = 4.2 \text{ units} \)  
D. \( L = 6 \text{ units}, \ W = 3 \text{ units} \)  

47 A booklet containing individual basketball statistics for the season indicates that the median of free throws was 23. Which of the following answers best corrects the error?  

A. 45 is the median; it appears the most often.  
B. 23 is correct; it is the middle number in the data.  
C. The median is 33; the writer forgot to order the numbers.  
D. The median is 35.2; it is the average.  

48 Which statement best describes a graph showing a positive correlation?  

A. The data points tend to fall from left to right.  
B. The data points tend to appear horizontal.  
C. The data points tend to appear vertical.  
D. The data points tend to rise from left to right.  

49 Ellie was calculating the height of a vertical drop of a thrill ride. She figured that it took 2 seconds for the riders to travel from the top to the bottom of the drop, and she was told that the riders were traveling at 136 feet per second. About how many feet was the vertical drop?  

A. 136 feet  
B. 272 feet  
C. 408 feet  
D. 1,360 feet  

50 “Crown molding” is a decorative strip of wood around the walls up by the ceiling of a room. How many linear feet of crown molding will Kentaro need for the 4 walls of his rectangular bedroom, which is 12 feet by 10 feet?  

A. 44 feet  
B. 48 feet  
C. 60 feet  
D. 120 feet
Diagnostic Test (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.

51 The map is scaled for $\frac{3}{4}$ of an inch to represent 30 miles. How far, in miles, is New Bern from Raleigh if the distance on the map is 2.5 inches?
   A 100 miles   B 75 miles   C 60 miles   D 22.5 miles

Use the following information to answer Questions 52 and 53.

The equations below represent two lines that intersect the y-axis to form a triangle.

\[2x + y = 8\]
\[x - 2y = 4\]

52 What is the perimeter of the triangle? 3.01
   A 23.4 units   B 20.6 units   C 20 units   D 10 units

53 What is the area of the triangle? 3.01
   A 40 square units   B 24 square units   C 20 square units   D 12 square units

54 Winona is building a deck. She needs to be sure the frame forms right angles in the corners. She measured out 6 feet in one direction and 8 feet in the other, as shown in the figure. How far apart should these 2 points be to ensure the angle is a right angle? 2.02
   A 14 feet   B 12 feet   C 10 feet   D 6 feet

55 Which could be the image of $\triangle FGH$ under a dilation of magnitude 2.5? 3.03
   A $\triangle FGH$   B $\triangle JKL$   C $\triangle MNO$   D $\triangle PQR$
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.

56 The number of seconds that it takes a pendulum to swing back and forth can be approximated by finding the square root of the length of the pendulum, measured in meters, and then doubling the result. About how long would it take for a 40 meter pendulum to swing back and forth?

A 38 seconds  
B 36 seconds  
C 13 seconds  
D 6 seconds

57 Larry was delivering pizzas between the hours of 8:30 P.M. and 11:00 P.M. on Saturday. Which inequality represents the window of time, \( t \), that Larry was delivering pizzas? 5.03

A \( t > 8 \text{ h } 30 \text{ min} \)  
B \( 8 \text{ h } 30 \text{ min} \leq t \leq 11 \text{ h} \)  
C \( 8 \text{ h } 30 \text{ min} < t < 11 \text{ h} \)  
D \( t < 11 \text{ h} \)

58 The two graphs show total sales for the same grocery store throughout five consecutive weeks. If the store manager is reporting to her district manager, which answer is the best reason for the store manager to choose graph 2 over graph 1? 4.03

A Graph 2 starts at $1,500 dollars rather than at $500.  
B Graph 1 does not really reflect the store’s sales over the four weeks.  
C Graph 2 emphasizes that sales are increasing.  
D Graph 1 does not show the increase in sales.

59 Using the graphs from Question 58, why do the sales data in graph 2 appear to increase more rapidly? 4.03

A Since graph 2’s vertical axis is in increments of $100 rather than $500, sales appear to grow more rapidly.  
B Graph 1’s vertical axis peaks at $2,500 rather than at $2,000.  
C Graph 1’s vertical axis starts at $0 while graph 2’s vertical axis starts at $1,400.  
D The data look no different from graph to graph.
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 If the current temperature increases by 70 degrees, it will be the same as 5 less than 6 times the current temperature. What is the current temperature?

A $\ -15^\circ$  
B $\ -13^\circ$  
C $\ 13^\circ$  
D $\ 15^\circ$  

61 Which answer places the list of numbers in ascending order?  

$\sqrt{3}, -\sqrt{2}, \sqrt{8}, -\sqrt{8}, \sqrt{2}$  

A $\ -\sqrt{8}, -\sqrt{2}, \sqrt{2}, \sqrt{3}, \sqrt{8}$  
B $\ -\sqrt{2}, -\sqrt{8}, \sqrt{2}, \sqrt{3}, \sqrt{8}$  
C $\ \sqrt{8}, \sqrt{3}, \sqrt{2}, -\sqrt{2}, -\sqrt{8}$  
D $\ -\sqrt{2}, \sqrt{8}, \sqrt{3}, \sqrt{2}, -\sqrt{8}$

62 The figure shows the growth of the railway system in the United States during the mid-1800s. What correlation exists between years and miles of track laid?  

A negative correlation  
B positive correlation  
C slightly negative correlation  
D no correlation

63 Monica’s investment of $500 grows at a rate of 10% a year. How much money should Monica have after 4 years?  

4.02  
A $\$20,000$  
B $\$732.05$  
C $\$700$  
D $\$665.50$

64 Which is an equation of the line with slope $\frac{-2}{3}$ and $y$-intercept $-6$?  

5.02  
A $\ y + 6 = x + \frac{2}{3}$  
B $\ -\frac{2}{3}x - 6y = 0$  
C $\ y = -\frac{2}{3}x - 6$  
D $\ y = -6x - \frac{2}{3}$

65 Mack is building a regular hexagonal playpen for his daughter Paula. The base is shown in the figure. He knows he needs each central angle to be 60 degrees. How should the measures of $\overline{AB}$, $\overline{BC}$, and $\overline{AC}$ compare to each other to be sure the central angle is 60 degrees?  

2.02  
A $\overline{AB}$ should be twice $\overline{AC}$ and $\overline{BC}$.  
B $\overline{AB}$ should be half $\overline{AC}$ and $\overline{BC}$.  
C $\overline{AB} = 5$ feet, $\overline{BC} = 3$ feet, and $\overline{AC} = 4$ feet  
D $\overline{AB}$, $\overline{AC}$, and $\overline{BC}$ should all be equal.
66 By what factor should each edge of a cube be increased in order to increase its volume by a factor of 27? 2.01
A 27  B 9  C 3  D 2

67 The list below indicates the number of patients Dr. Fernado saw on each weekday last month. What is the average number of patients he saw each day? 4.01
62, 41, 39, 52, 89, 77, 63, 68, 92, 56, 47, 31, 80, 56, 34, 71, 55, 46, 78, 23
A 1,160 patients  B 92 patients  C 64 patients  D 58 patients

68 Karim is making wind chimes. Each wind chime requires four different lengths of wire: two pieces with each being 5 inches long, one piece 16 inches long, 3 pieces with each being four inches long, and one piece 10 inches long. How many inches of wire does he need to make five wind chimes? 5.04
A 240 inches  B 120 inches  C 96 inches  D 48 inches

69 Which is an equation of the line with slope 4 containing the point (1, 3)? 5.02
A \( y = 4x - 7 \)  B \( y = 4x + 3 \)  C \( y - 3 = 4(x - 1) \)  D \( y - 1 = 4(x - 3) \)

70 The grade of a road is 20 percent. Which figure could represent the road? 3.01
A  
B  
C  
D  

Go on
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 In the figure below, the top row contains two tennis balls, the second row contains four tennis balls, and so on. If the pattern continues, how many tennis balls will be in the seventh row? 1.02

72 Your parents are installing a rectangular in-ground pool with dimensions 24 feet by 10 feet. They decide to place a walkway around the pool 3 feet wide. What is the area of the proposed walkway? 5.04

73 An airplane is approaching Charlotte—Douglas International Airport at an altitude of 10,000 feet. The plane begins descending at a rate of 350 feet per minute. What will be its altitude after 14 minutes? 4.02

74 Which is an equation of the line with slope $\frac{1}{3}$ containing the point (6, 0)? 5.02

75 Suppose that a horse is tied to the corner of a barn at point A as shown in the figure. The rope has length 20 meters. What area can the horse roam? 3.02
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 1,947.057463 to the nearest thousandth?  
A 2,000  
B 1,947.06  
C 1,947.057  
D 1,947.057

77 The graph represents the number of visitors to South Mountain State Park during one week this past summer. What does the data point on the vertical axis represent?  
A visitors on Sunday  
B visitors to the park for the week  
C visitors on the weekend  
D visitors on Monday

78 Manirva must average at least a 90 on 4 test scores to earn an A. Her scores so far are 86, 94, and 88. What score S must she have on the last test to earn an A?  
A S ≥ 92  
B S > 92  
C S ≥ 91  
D S > 89

79 Which is an equation of the line with slope 0 containing the point (7, 9)?  
A y = 7  
B x = 7  
C y = 9  
D x = 9

80 Which is the graph of a nonlinear function of x?  
A  
B  
C  
D
Standards 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.

OBJECTIVE 1.01 Develop number sense for the real numbers.
• Define and use irrational numbers.
• Compare and order.
• Use estimates of irrational numbers in appropriate situations.

1 Round the number 5.014937 to the nearest hundredth.  
A 5  
B 5.01  
C 5.014  
D 5.015

2 Vince ran the race held in Raleigh this past Saturday in 48 minutes. If Vince is an average adult runner, which distance represents a reasonable distance for the race Vince ran?  
A 30 yards  
B 200 feet  
C 3 miles  
D 20 miles

3 On the number line, which letter represents the square root of 19?  
A T  
B U  
C V  
D W

4 Agriculture contributes 59 billion dollars to North Carolina’s economy. What is 59 billion expressed in scientific notation?  
A $59 \times 10^{11}$  
B $5.9 \times 10^{10}$  
C $5.9 \times 10^{9}$  
D $59 \times 10^{6}$

5 Which number is greatest?  
A $\frac{2}{3}$  
B 0.54  
C 0.5  
D $\frac{1}{5}$
Standards 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.

OBJECTIVE 1.01 (continued)

6 A circular dartboard is divided into four parts. Which part appears to represent $\frac{1}{4}$ of the dartboard?

A I  
B II  
C III  
D IV

7 Morgan plans to walk two miles to the theater to see a matinée movie showing at two o’clock. What would be a reasonable time for her to leave her house so that she arrives on time?

A 9:00 P.M.  
B 9:45 A.M.  
C 1:15 A.M.  
D 1:15 P.M.

8 The length of the line segment is close to that of an irrational number, in inches. Which irrational number could reasonably be the length of the line segment?

A $\sqrt{2}$  
B $\sqrt{17}$  
C $\sqrt{20}$  
D $\sqrt{40}$

9 The following data give the average daily low temperature during the summer months of a year in North Carolina. Which answer places the temperatures in descending order?

June, 62; July, 63; August, 65; September, 54

A 54, 63, 65, 62  
B 65, 63, 62, 54  
C 54, 62, 63, 65  
D 65, 54, 63, 62

10 Which one of the following inequalities is true?

A $\frac{1}{2} > \frac{1}{5}$  
B $\frac{1}{4} \geq \frac{2}{3}$  
C $1.41 < 1.402$  
D $-11 > -4$
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.

**OBJECTIVE 1.01** (continued)

11 Which number is an irrational number?

A \(-1.45\)  \hspace{1cm} \textbf{B} \frac{2}{5}

C \(\sqrt{5}\)  \hspace{1cm} \textbf{D} 33.3

12 Lakeshia has 32 nickels, representing about \(\frac{1}{3}\) of her coin collection.
Approximately how many coins does Lakeshia have in her collection?

A 33 coins  \hspace{1cm} \textbf{B} 50 coins

C 75 coins  \hspace{1cm} \textbf{D} 100 coins

13 Mallory skips through the hopscotch squares, landing on only the even numbered squares. Which numbered square does she skip?

\begin{center}
\begin{tabular}{c|c}
4 & 26 \\
-\hline
11 & 44 \\
\end{tabular}
\end{center}

A 4  \hspace{1cm} \textbf{B} 11

C 26  \hspace{1cm} \textbf{D} 33

14 How many squares in the figure would be needed to represent \(\frac{1}{3}\) the area of the figure?

\begin{center}
\begin{tabular}{|c|c|c}
\hline
A & 3 & \textbf{B} 6 \\
C & 9 & \textbf{D} 12
\end{tabular}
\end{center}

15 Which answer lists the numbers in descending order?

\(5\frac{4}{7}, -12, 0, 3.01, \sqrt{25}\)

\begin{align*}
\text{A} & \quad 5\frac{4}{7}, \sqrt{25}, 3.01, 0, -12 \\
\text{B} & \quad 0, 3.01, \sqrt{25}, 5\frac{4}{7}, -12 \\
\text{C} & \quad -12, 0, 3.01, \sqrt{25}, 5\frac{4}{7} \\
\text{D} & \quad -12, 5\frac{4}{7}, \sqrt{25}, 3.01, 0
\end{align*}
Standards 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.

OBJECTIVE 1.01 (continued)

16 Which value of \( x \) would make the following statement true?
\[-2.01 < x < -2.001\]
A \(-3\)
B \(-2.02\)
C \(-2.001\)
D \(-2\)

17 Which number is a rational number?
A \( \frac{5}{7} \)
B \( \sqrt{3} \)
C \( \pi \)
D \( \sqrt{14} \)

18 Of the 31 million acres in North Carolina, 9.1 million acres are used for farming. Which number represents 9.1 million?
A 910,000,000
B 91,000,000
C 9,100,000
D 91,000

19 Which of the following numbers is the third greatest?
4, \(-13\), 0, \(-11\), 3.99, \(-2.5\), \(-7\)
A \(-13\)
B \(-2.5\)
C 0
D 4

20 Which of the following numbers are integers?
\( \frac{1}{2}, 4, 0.3, \sqrt{5}, \frac{2}{5}, \sqrt{19}, 0 \)
A \( \frac{1}{2}, \frac{2}{5} \)
B 4, 0
C \( \sqrt{5}, \sqrt{19} \)
D 4, \( \sqrt{19}, 0 \)
Standards 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.

**OBJECTIVE 1.01 (continued)**

21 Adam wants to make only \( \frac{2}{3} \) of the cookies in a cookie recipe. The recipe calls for 4 cups of sugar. How much sugar should he use?
- A 8 cups
- B 4 cups
- C \( \frac{8}{3} \) cups
- D \( \frac{2}{3} \) cup

22 One of the numbers below is undefined. Which one is it?
- A \( \frac{-4}{-3} \)
- B \( \frac{5}{0} \)
- C \( \frac{0}{5} \)
- D \( \frac{8}{1} \)

23 On her last math exam Frannie earned an 80%. The next math exam will be worth 40 points. To earn 80% or more on the next exam, what is the least amount of points Frannie must earn?
- A 20 points
- B 25 points
- C 32 points
- D 33 points

24 Which set contains only whole numbers?
- A \( \{2, 8, 5, 0\} \)
- B \( \{-7, 4, 0, -2\} \)
- C \( \{\frac{1}{2}, \frac{3}{4}, -\frac{4}{5}, \frac{1}{9}\} \)
- D \( \{-1, -7, -11, -13\} \)

25 Which number is less than \( \sqrt{49} \)?
- A 48
- B 25
- C 10
- D 6

26 On Monday Hannah played 8 video games. On which day of the week did Hannah play more than \( 10^2 \) video games?
- A Monday
- B Tuesday
- C Wednesday
- D Thursday

Name
Date
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.

OBJECTIVE 1.02 Develop flexibility in solving problems by selecting strategies and using mental computation, estimation, calculators or computers, and paper and pencil.

1 Maggie told invited friends that they could each bring, at most, three of their friends to her party. Seven friends attended the party, but only four brought guests. At most how many people were at Maggie’s party?
   A 20 people
   B 16 people
   C 12 people
   D 7 people

2 Manuel estimates that during his nine week summer vacation he played video games about two hours a day on weekdays and three hours a day on weekends. Approximately how many hours did Manuel spend playing video games last summer?
   A about 45 hours
   B about 90 hours
   C about 150 hours
   D about 195 hours

3 The Tweed’s monthly grocery bill has been growing. In January the bill was $340, in February, $346, in March, $354, and in April the bill was $364. If this pattern continues, what will it be in May?
   A $356
   B $370
   C $364
   D $376

4 Last week Liz worked 30 hours for $6.25 per hour. How much money did Liz make working last week?
   A $180
   B $187.50
   C $190.50
   D $210

5 The figure shows four rows of boxes stacked in a pattern. If the pattern holds and a fifth row is inserted at the bottom, how many boxes would be in the new bottom row?

   Row 1
   Row 2
   Row 3
   Row 4

   A 15 boxes
   B 18 boxes
   C 20 boxes
   D 25 boxes
Standards 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.

OBJECTIVE 1.02 (continued)

6 North Carolina has 78,000 miles of paved roads, more than any other state. The population of North Carolina is approximately 8.2 million people. If the entire population lined up evenly by the roads, approximately how many people would there be per mile?
A 105 people per mile  B 624 people per mile
C 1,000 people per mile  D 10,000 people per mile

7 What is the measure of the missing angle?
A 60  B 45
C 30  D 25

8 What is a reasonable approximation of the product of 61 and 199?
A 160  B 1,200
C 12,000  D 16,000

9 To win the presidency of the student council, Tanner needed at least 42% of the votes cast. A total of 600 students voted. What was the minimum number of votes in Tanner’s winning total?
A 252 votes  B 240 votes
C 232 votes  D 100 votes

10 Five percent of what number gives 84?
A 168  B 420
C 1,680  D 8,400

11 Which company’s stock is worth the most money in this particular portfolio?

<table>
<thead>
<tr>
<th>Stock</th>
<th>Per Share</th>
<th>Shares Owned</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company A</td>
<td>$21.97</td>
<td>13</td>
</tr>
<tr>
<td>Company B</td>
<td>$18.32</td>
<td>16</td>
</tr>
<tr>
<td>Company C</td>
<td>$10.33</td>
<td>29</td>
</tr>
<tr>
<td>Company D</td>
<td>$8.25</td>
<td>36</td>
</tr>
</tbody>
</table>
A Company A  B Company B
C Company C  D Company D
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.

**OBJECTIVE 1.02 (continued)**

12 Mountain time is two hours earlier than Eastern time. North Carolina is located in the Eastern time zone. If it is 9:30 A.M. in North Carolina, what time is it in Denver, Colorado, which is located in the Mountain time zone?

A 11:30 A.M.  
B 10:30 A.M.  
C 7:30 A.M.  
D 6:30 A.M.

13 The newspaper lists that a movie begins at 10:30 A.M. and ends at 12:15 P.M. How long is the show in minutes?

A 1 hour and 40 minutes  
B 105 minutes  
C 75 minutes  
D 2 hours

14 Caroline picked up four sticks. The second stick was twice as long as the first stick, the fourth was one inch longer than the third, and the third was half the size of the second. If the first stick measured 14 inches, how long was the fourth stick?

A 28 inches  
B 15 inches  
C 14 inches  
D 7 inches

15 Joni threw two darts at the dartboard. If both darts scored, how many different point totals could Joni possibly earn?

A 3 different point totals  
B 4 different point totals  
C 5 different point totals  
D 6 different point totals

16 Illya is driving home from Chicago, Illinois, to Charlotte, North Carolina, a distance of about 785 miles. If she averages 55 miles per hour, approximately how long will it take Illya to drive home?

A 10 hours  
B 11 hours  
C 13 hours  
D 14 hours
17 Average temperatures are listed for Asheville. During what season is the difference between the high temperature and the low temperature the greatest?

A  Winter  B  Spring  C  Summer  D  Fall

<table>
<thead>
<tr>
<th></th>
<th>Winter</th>
<th>Spring</th>
<th>Summer</th>
<th>Fall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average High</td>
<td>49</td>
<td>68</td>
<td>84</td>
<td>68</td>
</tr>
<tr>
<td>Average Low</td>
<td>28</td>
<td>42</td>
<td>61</td>
<td>45</td>
</tr>
</tbody>
</table>

18 The figures are proportional. Which is the missing length?

A  1.1 centimeters  B  2.2 centimeters  C  6.6 centimeters  D  72 centimeters

19 What two numbers have a sum of 24 and a product of 135?

A  9 and 15  B  10 and 13.5  C  10 and 14  D  12 and 12

20 A vendor at Carolina Beach State Park sells four different items. If today is Monday and the next shipment will not arrive until Thursday evening after closing, which item will the vendor most likely run out of before the next shipment arrives?

<table>
<thead>
<tr>
<th></th>
<th>Sunglasses</th>
<th>Hats</th>
<th>Sunscreen</th>
<th>Towels</th>
</tr>
</thead>
<tbody>
<tr>
<td>In Stock</td>
<td>85</td>
<td>24</td>
<td>50</td>
<td>33</td>
</tr>
<tr>
<td>Sales Per Day</td>
<td>20</td>
<td>3</td>
<td>13</td>
<td>5</td>
</tr>
</tbody>
</table>

A  sunglasses  B  hats  C  sunscreen  D  towels

21 Tillda decides that she will keep 10 of her CDs and divide the rest equally among six friends. If Tillda had 172 CDs, how many did each of her friends receive?

A  34 CDs  B  27 CDs  C  19 CDs  D  13 CDs
If Jerome follows the map, how many different ways can he travel from Asheville to Wilmington without traveling any road more than once?

A 3 different ways  
B 4 different ways  
C 6 different ways  
D 8 different ways

What number can you subtract from 411.359 to get 411.309?

A 0.0005  
B 0.005  
C 0.05  
D 0.5

What would be the approximate area of a triangle if its base measured 10 inches and its height 2 feet?

A 10 feet  
B 120 square inches  
C 10 square feet  
D 120 inches

Brittney has 42 quarters, 121 dimes, 87 nickels, and 201 pennies in her piggy bank. How much money does she have in her piggy bank?

A 451 coins  
B $451  
C $32.17  
D $28.96

On Saturday the hardware store sold nuts and bolts in a ratio of 3 to 5. If 600 nuts were sold, how many bolts were sold?

A 1,000 bolts  
B 1,800 bolts  
C 3,000 bolts  
D 9,000 bolts

If \( x = 7 \) and \( y = 11 \), what is the difference between their product and their sum?

A 77  
B 59  
C 18  
D 4
Standards 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.

**OBJECTIVE 2.01** Determine the effect on perimeter, area or volume when one or more dimensions of two- and three-dimensional figures are changed.

1 Corey’s current garden, which he would like to expand, is rectangular with a length of 20 feet and a width of 10 feet. What effect does doubling the length and width have on the area of the garden?
   A increases by a factor of 2
   B increases by a factor of 4
   C increases by a factor of 20
   D increases by a factor of 40

2 Jack’s dartboard is too small. He misses the dartboard too often and hits the wall. The wall is a square with sides measuring 8 feet. What is the area of the largest circular dartboard that Jack can place on the wall?
   A 4 feet
   B 200.96 square feet
   C $64\pi$ square feet
   D $16\pi$ square feet

Use the following information to answer Questions 3–5.

Use the following information to answer Questions 3–5.

Nick must decide between two fish tanks which are similar right rectangular prisms.

3 What is the ratio of the corresponding edges of the small tank to the corresponding edges of the large tank?
   A $\frac{1}{3}$
   B 3
   C 0.33
   D $\frac{3}{1}$

4 What is the ratio of the lateral areas of the small and large tanks?
   A 9:1
   B 3:1
   C 1:9
   D 1:3

5 What is the ratio of the volumes of the small and large tanks?
   A 3:2
   B 6:9
   C 27:1
   D 1:27
Standards 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.

OBJECTIVE 2.01 (continued)

6 What are the dimensions of a square resulting from doubling the area of a square measuring 4 feet by 4 feet?
A 8 feet by 8 feet
B 8 feet by 4 feet
C 4 feet by 8 feet
D $4\sqrt{2}$ by $4\sqrt{2}$

7 By what factor will reducing the radius of a cylinder by a factor of $\frac{1}{3}$ reduce its volume?
A 3
B $\frac{1}{3}$
C $\frac{1}{9}$
D $\frac{1}{27}$

8 A play director determines that the 3.5 foot diameter spotlight for soloists needs to have its diameter doubled. By what factor will the lighted area increase?
A 2
B $\pi$
C 4
D 7

9 A baseball diamond actually is a square with 90-foot sides and vertices home plate, first base, second base, and third base. If the distance between the bases were instead 100 feet, by how much would the shortest distance from first to third base be increased?
A 10 feet
B about 14 feet
C about 40 feet
D 100 feet

10 If a square play area is fenced by 80 feet of fencing instead of by 40 feet of fencing, by what factor will the area increase?
A 80
B 40
C 8
D 4

11 Ice cream cones used by an ice cream parlor are right circular cones. If the ice cream parlor plans to use cones that have twice the volume but the same radius as standard cones, by what factor must the cone’s height increase to double the volume of the cone?
A 2
B $\pi$
C 4
D $2\pi$
Standards 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.

OBJECTIVE 2.01 (continued)

12 The vertical cylinder design of a corn silo is too tall, and must be reduced in height by a factor of $\frac{1}{5}$ without changing the radius. If the height of the original design was 75 feet and the radius 10 feet, by what factor would the volume of the smaller silo be reduced from the larger?

A $\frac{1}{5}$  
B $\frac{2}{5}$  
C 10  
D 15

13 Refer to Question 12. By what factor was the lateral area of the original silo design reduced?

A $\frac{1}{5}$  
B $\frac{2}{5}$  
C 10  
D 15

14 The four points {(0, 0), (2, 0), (0, 2.5), (2, 2.5)} define a rectangular polygon. Create a new polygon by dilating the first by a factor of $\frac{1}{4}$. What is the ratio of the perimeter of the smaller rectangle to the ratio of the perimeter of the larger rectangle?

A $\frac{1}{4}$  
B 5 units squared  
C 80 units squared  
D $\frac{1}{4}$

15 Using the rectangles from Question 14, by what factor do you have to multiply the area of the larger rectangle to obtain the area of the smaller rectangle?

A 16  
B 4  
C $\frac{1}{4}$  
D $\frac{1}{16}$

16 A triangle has a base of length $a$ and a height of length $b$. If both the base and height are multiplied by $x$, a number greater than one, what is the ratio of the area of the larger triangle to the area of the smaller triangle?

A $A = \frac{ab}{2}$  
B 4  
C $x^2$  
D $A = \frac{abx^2}{2}$
Standards 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.

OBJECTIVE 2.01 (continued)

Use the following information to answer Questions 17 and 18.
The Great Pyramid of Giza in Egypt is a regular square pyramid with a height of 482 feet and base edge lengths of 754 feet each.

17 What would be a reasonable factor to reduce the real pyramid’s dimensions to those of a usable scale model?

A \( \frac{1}{100} \)  
B \( \frac{1}{1100} \)  
C \( \frac{1}{500} \)  
D \( \frac{1}{1000} \)

18 A scale model of the Great Pyramid of Egypt has a height of 48.2 feet, and base edge lengths of 75.4 feet. By what factor must the volume of the scale model increase to equal the volume of the actual pyramid?

A 10  
B 27.2  
C 123.6  
D 1,000

19 A 6-inch by 10-inch piece of construction paper is formed, without overlapping edges, to make a cylinder with a height of 6 inches. Then, it is re-formed to make a cylinder with a height of 10 inches. What is the ratio of the 10 inch high cylinder’s lateral area to that of the 6 inch high cylinder?

A 1:1  
B 6:10  
C 10:6  
D 60:1

20 A triangle has a base of 24 centimeters and a height of 13.5 centimeters. Which row from the table describes a second triangle that is similar to the one described?

<table>
<thead>
<tr>
<th>Row</th>
<th>Base</th>
<th>Height</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>48</td>
<td>26</td>
<td>624 square centimeters</td>
</tr>
<tr>
<td>2</td>
<td>48</td>
<td>27</td>
<td>648 square centimeters</td>
</tr>
<tr>
<td>3</td>
<td>24x</td>
<td>27x</td>
<td>324x square centimeters</td>
</tr>
<tr>
<td>4</td>
<td>24x</td>
<td>26x</td>
<td>312x square centimeters</td>
</tr>
</tbody>
</table>

A Row 1  
B Row 2  
C Row 3  
D Row 4
Standards 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.

OBJECTIVE 2.01 (continued)

21 Mark designed a storage shed in his backyard in the shape of a right rectangular prism with a width of 5 feet and a length of 7 feet. He then decided to double the length and triple the width. If the height stays the same, by what factor does the volume of the storage shed increase?

A 2
B 3
C 5
D 6

22 The average area of a farm in North Carolina is 163 acres. If this area decreased by a factor of 0.3, then what would be the average size farm in North Carolina?

A 160 acres
B 114.1 acres
C 48.9 acres
D 0.3 acres

23 What would increasing the radius by a factor of 1.1 have on the volume of a circular swimming pool?

A increases by a factor of 1.21
B decrease by a factor of 1.1
C decreases by a factor of 1.21
D would have no effect

24 What effect would cutting off \( \frac{1}{3} \) the length of a rectangular scarf have on its area?

A reduce by a factor of \( \frac{1}{9} \)
B reduce by a factor of \( \frac{1}{3} \)
C reduce by a factor of 3
D area remains unchanged

25 By what factor does tripling the length of each edge of a cube increase the volume of the cube?

A 81
B 27
C 9
D 3
Standards 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.

OBJECTIVE 2.02 Apply and use concepts of indirect measurement.

1. A tree and a light post near the tree each cast a shadow. What is the height of the tree?
   A. 800 feet
   B. 125 feet
   C. 80 feet
   D. 10 feet

2. The greater of two similar right triangles has a hypotenuse of length \( x \) and a leg measuring \( y \). The corresponding sides of the smaller triangle measure \( \frac{1}{3} \) those of the larger triangle. By what factor does the area of the larger triangle decrease to equal the area of the smaller triangle?
   A. \( \frac{xy}{2} \)
   B. \( \frac{2}{3} \)
   C. \( \frac{1}{3} \)
   D. \( \frac{1}{9} \)

3. Using your ruler, measure the length and width of Herbert’s bedroom to the nearest quarter of an inch. What are the actual dimensions?
   A. 24 feet by 15 feet
   B. 18 feet by 10 feet
   C. 15 feet by 6 feet
   D. 10 feet by 4 feet

4. What is \( x \)?
   A. 14.9 centimeters
   B. 3.725 centimeters
   C. 3.675 centimeters
   D. 1.5 centimeters

5. A model of Hickory Nut Falls is 40.4 centimeters high. If the scale for the model is 1 centimeter equals 10 feet, how high are the actual falls?
   A. 40.4 feet
   B. 101 feet
   C. 404 feet
   D. 4,040 feet
Standards 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.

OBJECTIVE 2.02 (continued)

Use the following information to answer Questions 6 and 7.

In order to measure the distance across the lake shown in the figure, Jeff used 2 similar triangles.

6 Which proportion could Jeff use to find $AB$?

A \[
\frac{\overline{AB}}{20} = \frac{6}{300}
\]

B \[
\frac{\overline{AB}}{20} = \frac{300}{6}
\]

C \[
\frac{\overline{AB}}{6} = \frac{300}{20}
\]

D \[
\frac{\overline{AB}}{300} = \frac{6}{20}
\]

7 What is the measure of $\overline{AB}$?

A 1,000 meters  
B 600 meters  
C 200 meters  
D 100 meters

8 The graph shows the path of a North Carolina State mini football thrown in the air from a height of 6 feet. What is the maximum height the ball reaches?

A 6 feet  
B 19 feet  
C 25 feet  
D 50 feet

9 Maxie saw lightning and then heard the thunderclap from an approaching thunderstorm. He counted 15 seconds between the lightning flash and the roar of the thunder. Dividing the number of seconds by 5 gives an approximation for the distance of a storm in miles. About how many miles away is the thunderstorm?

A 45 miles  
B 30 miles  
C 5 miles  
D 3 miles
Standards 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.

OBJECTIVE 2.02 (continued)

Use the following information to answer Questions 10 and 11.

In order to calculate the height of a flagpole, Samantha measured the length of her shadow and the length of the flagpole’s shadow. The results are shown in the figure. She is 4 feet tall.

10 Which proportion could Samantha use to find the height of the flagpole?

A \( \frac{6}{x} = \frac{4}{30} \)
B \( \frac{4}{6} = \frac{30}{x} \)
C \( \frac{x}{4} = \frac{6}{30} \)
D \( \frac{4}{x} = \frac{6}{30} \)

11 How tall is the flagpole?

A 28 feet
B 20 feet
C 15 feet
D 10 feet

Use the following information to answer Questions 12 and 13.

There is a bull in the rectangular pen shown in figure \(ABCD\). Mario cannot safely measure the distance from point \(A\) to point \(C\). Instead, he measures \(AB\) to be 40 meters and \(AD\) to be 30 meters and calculates the distance \(AC\).

12 What geometric concept can Mario use to find \(AC\)?

A congruent triangles
B similar triangles
C guess
D Pythagorean Theorem

13 What is the shortest distance between point \(A\) and point \(C\)?

A \(10\sqrt{7}\) meters
B 35 meters
C 50 meters
D 70 meters
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.

**OBJECTIVE 2.02 (continued)**

14 Sarah drives a distance of approximately 200 miles from Cherokee to Winston-Salem in 4 hours. At about what speed is she traveling?

A 40 miles per hour  
B 50 miles per hour  
C 60 miles per hour  
D 100 miles per hour

15 Justin wanted to figure out how far above the ground a bird nest in a tree was. He leaned his 25 foot ladder against the tree so the top of the ladder just reached the nest, as shown in the figure. He then measured the distance from the bottom of his ladder to the base of the tree directly underneath the nest. This distance was 7 feet. How high above the ground is the bird nest?

A 24 feet  
B 20 feet  
C 18 feet  
D 13 feet

16 Alissa had only a 12 ounce glass with which to measure the amount of water in a pitcher. If the pitcher holds \(4\frac{1}{3}\) glassfuls, how many ounces does the pitcher hold?

A 66 ounces  
B 52 ounces  
C 48\(\frac{1}{3}\) ounces  
D 3 ounces

17 A map of the zoo has scale 1 inch equal to 2,640 feet. The map distance from the entrance to the monkey house is \(\frac{3}{4}\) inch. How far is it from the entrance to the monkey house?

A 3,520 feet  
B 1,980 feet  
C 660 feet  
D 240 feet

18 There are 64 steps up to the museum’s entrance. If each step rises 4 inches, how far above the ground is the entrance to the museum?

A 16 inches  
B 68 inches  
C 192 inches  
D 256 inches
Use the following information to answer Questions 19 and 20.

Andre needed to calculate the distance around a circular field so he could replace the fence. Unfortunately, part of the field was under water from a heavy rain, so he could not walk all the way around the field to measure the distance. Before the field flooded he had marked the northernmost point on the old fence \( X \) and the easternmost point \( Y \) as shown in the figure. He measured the distance from \( X \) to \( Y \) around the field and found it was 300 feet.

19 How could Andre use this information to find the circumference of the entire field?

A Since the distance from \( X \) to \( Y \) is half the circle, he could double his measurement.
B Since the distance from \( X \) to \( Y \) is one-third of the circle, he could multiply his measurement by 3.
C Since the distance from \( X \) to \( Y \) is one-fourth of the circle, he could multiply his measurement by 4.
D Since the distance from \( X \) to \( Y \) is one-eighth of the circle, he could multiply his measurement by 8.

20 What is the circumference of the field?

A 1,800 feet
B 1,200 feet
C 600 feet
D 300 feet

21 The bed of a truck holds 1,920 cubical boxes that are 1 foot on each side. If the height of the truck bed is 10 feet, which is a possible combination for the length and width of the truck bed?

A 20 feet, 9 feet
B 18 feet, 12 feet
C 24 feet, 8 feet
D 16 feet, 16 feet

22 A model of Fontana Dam is 9.6 inches high and 47.3 inches long. If the scale is 1 inch equals 50 feet, how long is the real dam?

A 28,380 feet
B 5,760 feet
C 2,365 feet
D 480 feet
Standards 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.

**OBJECTIVE 3.01** Represent problem situations with geometric models.

1. What is the area of the label on the side of a can of soup if the radius of the can is 2 inches, the height is 4 inches, and the label completely covers the sides?
   - A 16π square inches
   - B 16 square inches
   - C 4π square inches
   - D 8 square inches

2. Which geometric figure represents the label from the side of the soup can?
   - A
   - B
   - C
   - D

3. Which triangle could be used to find the distance Tereika is from home?
   - A
   - B
   - C
   - D

4. How far is Tereika from home?
   - A 3 miles
   - B 4 miles
   - C 5 miles
   - D 6 miles

Use the following information to answer Questions 3 and 4.
Tereika leaves home and bikes 2 miles south, 3 miles west, 1 mile south, and 1 mile west.
Standards 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.

OBJECTIVE 3.01 (continued)

For Questions 5 and 6, use the figure shown. The volume of each cube is 8 cubic millimeters.

5 What is the volume of this figure?
   A  40 cubic millimeters   B  48 cubic millimeters
   C  56 cubic millimeters   D  64 cubic millimeters

6 What is the surface area of this figure?
   A  52 square millimeters   B  76 square millimeters
   C  88 square millimeters   D  104 square millimeters

Use the following information to answer Questions 7 and 8.
Paige put a frame 2 inches wide around a picture of the Cowan Museum that is 9 inches by 12 inches.

7 Which geometric model illustrates this problem?
   A
   B
   C
   D

8 What is the area of the frame?
   A  208 square inches   B  154 square inches
   C  108 square inches   D  100 square inches
OBJECTIVE 3.01 (continued)

9 What is the perimeter of the lot shown in this figure?

A 600 feet  
B 450 feet  
C 300 feet  
D 150 feet

10 The inside dimensions of Tommy’s red rectangular wagon are 12 inches by 24 inches. Tommy has a set of alphabet blocks. Each block is square, 4 inches on each side, and \( \frac{1}{2} \) inch thick, with one letter of the alphabet on it. If Tommy starts laying the blocks down next to each other in the wagon, in alphabetical order, and begins with the block labeled A, what is the letter on the last block that will fit in the wagon in one layer?

A M  
B R  
C T  
D X

For Questions 11 and 12, imagine a string wrapped around Earth at the equator, 2 inches above the surface. The radius of Earth is 3,960 miles.

11 Which figure illustrates this problem?

A  
B  
C  
D

12 How long would the string be?

A 7,924\( \pi \) inches  
B 95,092\( \pi \) inches  
C 41,838,724\( \pi \) inches  
D 501,811,204\( \pi \) inches
Standards 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.

OBJECTIVE 3.01 (continued)

Use the following information to answer Questions 13 and 14.
Jaime was driving his boat on a heading of 30° east of due south (S30°E) from Bath.

13 Which figure represents the path of the boat?

A

B

C

D

14 How far east of his starting point is Jaime after he travels a distance of 60 miles?

A 15 miles
B 30 miles
C 60 miles
D 120 miles

15 Rasheda wants to calculate the volume of water in the swimming pool shown in the figure. To do this, into what shapes can she divide the figure?

A rectangular prism and triangular prism
B 2 rectangular prisms
C rectangular prism and rectangular pyramid
D 2 triangular prisms

16 Ike had a map of North Carolina. The scale showed a distance of 70 miles was about the length of his thumbnail. He estimated that the length of the entire state was slightly more than 7 thumbnails. About how many miles long is the state of North Carolina?

A 580 miles
B 500 miles
C 420 miles
D 350 miles
Standards 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.

OBJECTIVE 3.01 (continued)

Use the following information to answer Questions 17 and 18.

Rhonda was shipping a globe to her cousin in Danbury. The globe has a radius of 6 inches. Rhonda packed the globe in a plastic mold that is a cube and extends 2 inches or more from all surfaces of the globe, as shown in the figure.

17 What are the dimensions of the smallest box in which Rhonda can pack her protected globe?
- A 8 inches by 8 inches by 8 inches
- B 10 inches by 10 inches by 10 inches
- C 16 inches by 16 inches by 16 inches
- D 18 inches by 18 inches by 18 inches

18 What would be the surface area of the box?
- A 5,832 square inches
- B 4,096 square inches
- C 1,944 square inches
- D 1,536 square inches

19 Ali was making a gelatin mold. She made enough gelatin to fill a rectangular mold 9 inches by 15 inches by 1 inch deep. However, she changed her mind and decided to make small cylindrical molds. How many cylindrical molds 2 inches in diameter and 2 inches high can she make? There will be some gelatin left over.
- A 21 molds
- B 16 molds
- C 10 molds
- D 5 molds

20 Jeremiah made this model with his blocks. It consists of 5 congruent cubes with a square pyramid on top. If the pyramid and the blocks are each 10 centimeters tall, about how tall is his model?
- A 65 centimeters
- B 60 centimeters
- C 55 centimeters
- D 50 centimeters
Standards 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.

OBJECTIVE 3.02 Apply geometric properties and relationships, including the Pythagorean theorem, to solve problems.

For Questions 1 and 2, use the figure showing a cereal box.

1 What is the surface area of the cereal box?
   A 136 square inches
   B 156 square inches
   C 192 square inches
   D 272 square inches

2 What is the volume of the cereal box?
   A 136 cubic inches
   B 156 cubic inches
   C 192 cubic inches
   D 272 cubic inches

3 Susan is holding the string for her kite as shown in the figure. If the string is 26 feet long, Susan’s hand is 4 feet above the ground, and Susan is standing 10 feet away from directly underneath her kite, how high above the ground is the kite?
   A 16 feet
   B 20 feet
   C 24 feet
   D 28 feet

4 The figure shows a miniature race track. The company is going to resurface the track. What is the area of track that will be covered with asphalt?
   A $180 + 110\pi$ square meters
   B $120 + 64\pi$ square meters
   C $120 + 39\pi$ square meters
   D $60 + 25\pi$ square meters
Standards 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.

OBJECTIVE 3.02 (continued)

5. Becky is planning to plant a field of pumpkin vines. They should be spaced about 6 feet apart. Approximately how many vines can she grow?

- A 2,160 plants
- B 360 plants
- C 60 plants
- D 10 plants

6. What is the area of the hot pad shown in the figure?

- A 432 square inches
- B 288 square inches
- C 216 square inches
- D 144 square inches

7. A town has a fenced rectangular dog park measuring 35.5 yards by 122 yards. The town wants to divide the park into two triangles by placing a fence along the diagonal. About how much fencing is required?

- A 4,331 yards
- B 157.5 yards
- C 127.1 yards
- D 472.5 feet

8. A copier has three reduction settings: 84%, 60%, or 10%. How could you combine these reductions, using the fewest steps possible, to reduce a picture to about 50% of its original size?

- A reduce the picture 10% five times
- B reduce the picture 60%
- C reduce the picture to a 60% reduction followed by a 10% reduction
- D reduce the picture to a 84% reduction followed by a 60% reduction

9. Which of the triples listed is a not a Pythagorean Triple?

- A 3, 4, 5
- B 15, 36, 39
- C 8, 15, 17
- D 12, 35, 38
Standards 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.

**OBJECTIVE 3.02** (continued)

10 The height of a stage being built for a bluegrass festival in Rocky Mount is 10 feet. The base of a ramp must be 9 yards from the base of the stage. How long will the ramp be, to the nearest tenth of a yard?
   A 13.5 feet  B 13.5 yards  C 9.6 yards  D 29 feet  

11 Hector was flying his kite with Marcos, who was standing directly under the kite. Hector’s hand was 4 feet above the ground; he had 200 feet of string out; and Marcos was 150 feet away from him. To the nearest foot, how high was the kite?
   A 132 feet  B 136 feet  C 140 feet  D 350 feet  

12 What would be the walking distance difference between walking along two sides of a 300 feet by 400 feet rectangular school playground to the opposite corner compared to walking diagonally across the playground to the opposite corner?
   A 100 feet  B 200 feet  C 500 feet  D 700 feet  

13 Ned and Roberta left Ned’s house at 8:00 A.M. to go for a run. Ned ran directly east, averaging 7 miles per hour while Roberta ran directly north at 5.6 miles per hour. How far apart were they after 2 hours?
   A approximately 18 miles  B 12.6 miles  C approximately 9 miles  D 1.4 miles  

14 Malcolm rides his bike 1 mile north, then 1 mile east, then 1 mile north, and then 1 mile east. How far is Malcolm from where he started?
   A 4 miles  B $2\sqrt{2}$ miles  C $\sqrt{2}$ miles  D 1 mile  

15 On a map, Statesville, Charlotte, and Fayetteville are located at approximately the vertices of a right triangle with the right angle located at Charlotte. The map’s scale is $\frac{3}{4}$ of an inch equals 30 miles. Statesville to Charlotte is approximately 1 inch; Statesville to Fayetteville is $3\frac{3}{4}$ inches. Approximately how many miles is it from Charlotte to Fayetteville?
   A 4 miles  B 30 miles  C 108 miles  D 145 miles
Standards 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.

**OBJECTIVE 3.02 (continued)**

16 Using the figure, find the value of $\frac{1}{2}x$ to the nearest tenth.
- **A** 20.3 centimeters
- **B** 12.6 centimeters
- **C** 7.9 centimeters
- **D** 6.3 centimeters

17 The TV opening in an entertainment center is a rectangle measuring 60 by 40 inches. At least two inches of space must be left open on both sides and above the TV. To the nearest tenth of an inch, what is the diagonal of the biggest TV that will fit in the opening? (Hint: this is not the diagonal of the screen, but rather of the front of the entire TV.)
- **A** 72.1 inches
- **B** 70 inches
- **C** 67.7 inches
- **D** 65.6 inches

18 An antenna consists of fifty 10-foot sections. Attached to the top of the antenna is a guy wire which is attached to the ground 350 feet from the base of the antenna. To the nearest foot, how long is the guy wire?
- **A** 3,500 feet
- **B** 610 feet
- **C** 500 feet
- **D** 360 feet

19 The figure is an isosceles trapezoid. If side $\overline{AB}$ measures 16.5 inches, $\overline{AX}$ is $\frac{1}{4}$ the measure of side $\overline{AB}$, and side $\overline{BC}$ measures 6.4 inches, what is $\overline{DX}$ to the nearest hundredth of an inch?

- **A** 52.80 inches
- **B** 22.98 inches
- **C** 10.10 inches
- **D** 4.89 inches

20 Renaldo and Beldon met at the starting line. Renaldo drove due north for 15 miles, then traveled west 32 miles. Meanwhile Beldon drove 15 miles due south, then drove east for 32 miles. To the nearest mile, how far apart were Renaldo and Beldon?
- **A** 94 miles
- **B** 71 miles
- **C** 47 miles
- **D** 35 miles
Standards 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.

OBJECTIVE 3.02 (continued)

21 A 20-foot extension ladder is leaning against the side of a house. Its base is 9.5 feet from the house. To the nearest tenth of a foot, how high up the wall does the ladder reach?

A 190 feet  
B 29.5 feet  
C 17.6 feet  
D 14.8 feet

22 Which set of numbers is not a Pythagorean Triple?

A 14, 48, 50  
B 9, 40, 41  
C 12, 35, 37  
D 19, 21, 29

23 A rectangular rose garden measures 117 feet by 222 feet. About how many 1.5-foot long bricks are needed both to create a brick border around the perimeter of the garden and to place bricks down one diagonal?

A 26,000 bricks  
B 625 bricks  
C 450 bricks  
D 340 bricks

24 An old geometry book shows a right triangle whose legs measure 23 centimeters and 14 centimeters with a hypotenuse of 18 centimeters. What is wrong with the figure?

A both legs of the triangle must be the same length  
B both legs of the triangle must be longer than the hypotenuse  
C the hypotenuse of the triangle must be longer than each leg  
D right triangles do not have a hypotenuse

25 What is the approximate length of the second leg of a right triangle with a hypotenuse of $3.1 \times 10^4$ and a leg of $2.4 \times 10^3$?

A $7.44 \times 10^7$  
B $5.5 \times 10^7$  
C $3.1 \times 10^4$  
D $0.7 \times 10^1$

26 Trent and Tina left their house on the way to Tania’s house. Trent walked 90 meters to Carolina Street, then made a right turn and walked the remaining 100 meters. Tina took a diagonal path from their house to Tania’s. To the nearest meter, how far did Tina walk?

A 134 meters  
B 135 meters  
C 190 meters  
D 900 meters
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.

**OBJECTIVE 3.03** Identify, predict, and describe dilations in the coordinate plane.

**For Questions 1–3, use the triangle shown in the graph.**

1. What will the coordinates of $A'$ be under a dilation of magnitude $\frac{1}{2}$?
   - A (1, 2)
   - B (2, 1)
   - C (4, 2)
   - D (−2, 4)

2. What will the coordinates of $B'$ be under a dilation of magnitude 3?
   - A $\left(\frac{5}{3}, 2\right)$
   - B (5, −6)
   - C (15, 18)
   - D (20, 24)

3. What will the coordinates of $C'$ be under a dilation of magnitude $\frac{2}{3}$?
   - A (3, 1)
   - B (6, 2)
   - C (18, 6)
   - D (27, 9)

**For Questions 4 and 5, use the rectangles shown in the graph.**

4. What type of transformation would map $ABCD$ onto $A'B'C'D'$?
   - A translation
   - B reflection
   - C rotation
   - D dilation

5. What is the magnitude of this transformation?
   - A 1
   - B 1.2
   - C 2
   - D 4
Standards 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.

OBJECTIVE 3.03 (continued)

6 If \( A \) has coordinates \((4, -6)\), what will the coordinates of \( A' \) be under a dilation of magnitude 3.5?

A \((14, -21)\)  
B \((12, -18)\)  
C \((7.5, -2.5)\)  
D \((\frac{8}{7}, -\frac{12}{7})\)

7 If \( W \) has coordinates \((-20, 40)\), what will the coordinates of \( W' \) be under a dilation of magnitude 0.1?

A \((20, -40)\)  
B \((-2, 4)\)  
C \((-0.2, 0.4)\)  
D \((-200, 400)\)

Use the following points for Questions 8 and 9.

\( \triangle XYZ \) with vertices \( X(-2, 6), Y(8, 4), Z(10, -2) \) is dilated to produce \( \triangle X'Y'Z' \) with \( Y'(4, 2) \).

8 What will the coordinates of \( X' \) be under this dilation?

A \((5, -1)\)  
B \((-1, 3)\)  
C \((6, -4)\)  
D \((-6, 4)\)

9 What will the coordinates of \( Z' \) be under this dilation?

A \((5, -1)\)  
B \((-1, 3)\)  
C \((6, -4)\)  
D \((-6, 4)\)

10 What is the magnitude of the dilation that maps \( M(-12, -16) \) onto \( M'(-9, -12) \)?

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

11 Which statement is true about a dilation?

A The preimage and the image are always the same size.  
B The preimage and the image can be different shapes.  
C The preimage and the image are in the same quadrant.  
D The preimage and the image are always the same shape.
Standards 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.

**OBJECTIVE 3.03** (continued)

12 $F$ has coordinates $(-2, 3)$. The coordinates of $G$ are $(2, 7)$. $F'$ is the image of $F$ under a dilation. If the coordinates of $F'$ are $(-4, 6)$, what are the coordinates of $G'$?

- A (7, 2)
- B (1, 3.5)
- C (4, 14)
- D (0, 10)

13 Which could be the image of rectangle 1 under a dilation of magnitude $\frac{1}{2}$?

- A rectangle 2
- B rectangle 3
- C rectangle 4
- D rectangle 5

14 What will be the coordinates of the image of $X$ under a dilation of magnitude 6?

- A (12, 4)
- B (36, $-12$)
- C (6, 24)
- D $\left(1, -\frac{1}{3}\right)$

15 If $F$ has coordinates $(0, 8)$, $G$ is $(-2, 4)$, and $H$ is $(2, -12)$, what is the image of $F$ under a dilation of magnitude 2.5?

- A $(-5, 10)$
- B $(5, -30)$
- C $(0, 20)$
- D $(2.5, 10.5)$
Standards 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.

OBJECTIVE 3.03 (continued)

16 The largest circle is a dilation of the smallest circle. What is the scale factor of the dilation?
A 6
B 4
C 3
D 2

17 Which scale factor produces an enlargement?
A 0.4
B 0.99
C 1.2
D \(2.1 \times 10^{-1}\)

18 If two parallelograms are congruent, what is the scale factor between them?
A 0
B \(\frac{1}{2}\)
C 1
D 2

19 Which point in the figure is the center of the dilation transforming the \(C\) in North Carolina into the much larger \(C'\)?
A \(A\)
B \(B\)
C \(C\)
D \(D\)

20 The large square is a dilation preimage of the smaller square. What is the scale factor?
A 4
B 2
C \(\frac{1}{2}\)
D \(\frac{1}{4}\)
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.

**OBJECTIVE 3.03** (continued)

21 Which of the following statements is true when a polygon is subjected to a dilation?
   A. corresponding angle measurement remains congruent
   B. the area of the two polygons remains the same
   C. corresponding segments always increase with a dilation
   D. corresponding segments always decrease with a dilation

22 If square $ABCD$ is subjected to a dilation with scale factor 1.5, how long would all sides of the resulting square measure? (Hint: Use your ruler to measure the length of one side of $ABCD$.)
   A. 2.25 inches
   B. 1.875 inches
   C. 1.5 inches
   D. 0.5 inch

23 On a coordinate plane, the line segment with endpoints $(0, 0)$ and $(-2, -5)$ is subject to a dilation with scale factor 5. What are the coordinates of the resulting line segment?
   A. $(5, 5)$ and $(3, 0)$
   B. $(0, 0)$ and $(2, 5)$
   C. $(0, 5)$ and $(-10, -25)$
   D. $(0, 0)$ and $(-10, -25)$

24 Which is the scale factor for the dilation that transforms triangle $XYZ$ into triangle $XY'Z'$?
   A. 4
   B. 3
   C. 2
   D. $\frac{1}{3}$

25 What is the magnitude of a dilation that maps $K\left(\frac{1}{2}, \frac{3}{5}\right)$ onto $K'(5, 6)$?
   A. 10
   B. 8
   C. 5
   D. 2
Standards 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.

OBJECTIVE 4.01 Collect, organize, analyze, and display data (including scatterplots) to solve problems.

Use the statistics to answer Questions 1 through 4.

Durham Rugrats 2003 Baseball Season

<table>
<thead>
<tr>
<th>Name</th>
<th>At Bats</th>
<th>Hits</th>
<th>Walks</th>
<th>Strikeouts</th>
<th>Batting Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burgess, N.</td>
<td>426</td>
<td>133</td>
<td>55</td>
<td>67</td>
<td>.312</td>
</tr>
<tr>
<td>Fox, R.</td>
<td>512</td>
<td>201</td>
<td>75</td>
<td>34</td>
<td>.393</td>
</tr>
<tr>
<td>Allen, P.</td>
<td>311</td>
<td>99</td>
<td>35</td>
<td>72</td>
<td>.318</td>
</tr>
<tr>
<td>Ward, R.</td>
<td>475</td>
<td>141</td>
<td>90</td>
<td>56</td>
<td>.297</td>
</tr>
<tr>
<td>Kittle, S.</td>
<td>396</td>
<td>98</td>
<td>47</td>
<td>101</td>
<td>.247</td>
</tr>
</tbody>
</table>

1 How many more hits did the player with the most hits have compared to the player with the third most hits?
   A 103 hits  B 68 hits  C 35 hits  D 34 hits

2 What is the average number of strikeouts for these five players?
   A 101 strikeouts  B 72 strikeouts  C 66 strikeouts  D 34 strikeouts

3 On-base percentage is the sum of the number of hits and walks divided by the number of at-bats and walks. Which player had the highest on-base percentage?
   A Ward, R.  B Kittle, S.  C Allen, P.  D Fox, R.

4 Collective batting average is the sum of all their hits divided by the sum of all their at-bats. What would be the lowest collective batting average needed at the end of the summer of 2004 to better the 2003 average?
   A .299  B .300  C .317  D .318

5 Nila was taking a survey in the school hallway, asking her classmates their ages, their heights, their weights, and the numbers of siblings they had. Which variable would be her best choice for the independent variable?
   A age  B height  C weight  D number of siblings
Standards 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.

OBJECTIVE 4.01 (continued)

Use the following information to answer Questions 6–9.
These were the daily high temperatures in a North Carolina town from May 1 through May 31:
73, 70, 67, 70, 55, 62, 65, 83, 87, 56, 55, 72, 56, 67, 81,

6 Which of the temperature intervals includes the greatest number of recorded highs during the month?
A 50°–59°  
B 60°–69°  
C 70°–79°  
D 80°–89°

7 What was the average high temperature to the nearest degree for the month?
A 77°  
B 71°  
C 69°  
D 62°

8 What was the median high temperature?
A 65°  
B 67°  
C 70°  
D 72°

9 Which high temperature is the mode?
A 55°  
B 65°  
C 67°  
D 81°

10 What is the correlation of the scatter plot?
A positive correlation  
B negative correlation  
C no correlation  
D slightly negative

11 When she returns home each day from a walk, Monique records a number from one to ten; the higher the number the farther she walked. What represents the independent variable in her situation?
A day of the week  
B the recorded number  
C distance Monique walked  
D no independent variable
Standards 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.

OBJECTIVE 4.01 (continued)

Use the following information to answer Questions 12–14.

Jen created the following table to help others find their way around town. Each ordered pair tells how to get from Jen’s house to the corresponding destination. For example, Library (5N, 3W) indicates the library is 5 blocks north and 3 blocks west. To answer the questions, graph the data on a coordinate plane with Jen’s home at the origin.

<table>
<thead>
<tr>
<th>Destination</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Library</td>
<td>(5N, 3W)</td>
</tr>
<tr>
<td>Grocery Store</td>
<td>(6S, 5E)</td>
</tr>
<tr>
<td>Swimming Pool</td>
<td>(4S, 7W)</td>
</tr>
<tr>
<td>School</td>
<td>(3N, 8E)</td>
</tr>
<tr>
<td>City Hall</td>
<td>(0N/S, 4E)</td>
</tr>
</tbody>
</table>

12. Drew was at the library and wanted to go to the grocery store. Which of the coordinates would get Drew from the library to the grocery store?

13. Umbreen was at school and needed to get to the swimming pool. Which directions should she follow?
   A. (3S, 8W)  B. (7S, 1W)  C. (7S, 15W)  D. (3S, 15W)

14. If a bird flew in a straight line from city hall to the school, how far would it fly?
   A. 8 units  B. 5 units  C. 4 units  D. 3 units

15. Which points define a line of best fit?
   A. A and C  B. A and D  C. F and D  D. E and B
Standards 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.

OBJECTIVE 4.01 (continued)

16 The top five farm commodities in North Carolina in the year 2001 are listed below, each with its sales in millions of dollars. Which list places the commodities in descending order according to their dollar value?

- Tobacco: 686, Broilers: 1,681, Turkeys: 452, Hogs: 1,710, Greenhouse/Nursery: 1,021
- A Turkeys, Tobacco, Greenhouse/Nursery, Broilers, Hogs
- B Tobacco, Broilers, Turkeys, Hogs, Greenhouse/Nursery
- C Hogs, Broilers, Greenhouse/Nursery, Turkeys, Tobacco
- D Hogs, Broilers, Greenhouse/Nursery, Tobacco, Turkeys

17 In Question 16, what dollar value of turkeys was sold?

- A $452,000,000
- B $4,520,000
- C $4,520
- D $452

18 What is the correlation between one’s age to adulthood and one’s height?

- A negative correlation
- B no correlation exists
- C correlation is not positive
- D positive correlation

19 What is the dependent variable in the following question: How far can a person run in 2 hours if he or she is able to run 7 miles in one hour?

- A rate
- B day of the week
- C distance
- D time

20 Which of these variables might be modeled by the scatter plot?

- A a child’s age and weight from birth through his/her teens
- B Olympic years and the 200 meter women’s winning freestyle time
- C a person’s age and how far he/she lives from Raleigh
- D a person’s weight

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.
Standards 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.

**OBJECTIVE 4.01 (continued)**

21 At 7:00 A.M. a bus left Charlotte heading west without stopping. The table indicates how far the bus is from Charlotte at the indicated time. Which of the following is *not* true?

<table>
<thead>
<tr>
<th>Time</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 A.M.</td>
<td>50 miles</td>
</tr>
<tr>
<td>9:00 A.M.</td>
<td>90 miles</td>
</tr>
<tr>
<td>10:00 A.M.</td>
<td>120 miles</td>
</tr>
<tr>
<td>11:00 A.M.</td>
<td>140 miles</td>
</tr>
</tbody>
</table>

A  the bus is decelerating  
B  the bus has traveled 4 hours  
C  the bus has traveled 140 miles  
D  the bus is accelerating

22 Which of these variables might be modeled by the scatter plot?

A  a child’s age and weight from birth through his/her teens  
B  Olympic years and the 200 meter women’s winning freestyle time  
C  a person’s age and how far he/she lives from Raleigh  
D  a person’s weight

23 What is the line of best fit for the points in the figure?

A  $\ell_1$  
B  $\ell_2$  
C  $\ell_3$  
D  $\ell_4$

24 If data have no linear correlation, which would be true of its graph?

A  data points would rise from left to right  
B  data points would fall from left to right  
C  one would not be able to graph the data  
D  data points would be scattered with no apparent pattern

25 The table lists the value of a stock at the end of four years. If the trend continues, which of the following is most likely true about the value of the stock in the year 2004?

<table>
<thead>
<tr>
<th>Year</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>$87.50</td>
</tr>
<tr>
<td>2001</td>
<td>$87.41</td>
</tr>
<tr>
<td>2002</td>
<td>$89.51</td>
</tr>
<tr>
<td>2003</td>
<td>$91.32</td>
</tr>
</tbody>
</table>

A  there is no apparent change  
B  it appears to be rising  
C  it appears to be falling  
D  1998 was a better year
Standards 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.

OBJECTIVE 4.02 Approximate a line of best fit for a given scatterplot; explain the meaning of the line as it relates to the problem and make predictions.

1 The data show the winning discus distance in selected Olympic competitions. In each ordered pair the first number is the year and the second number is the winning distance in feet. Which answer best represents the correlation among the data?

(1908, 134.1), (1928, 155.3), (1948, 173.2), (1968, 212.5), (1988, 225.8)

A positive correlation
B negative correlation
C slightly negative correlation
D no correlation

2 Using the data from Question 1, which would most likely be closest to the winning throw in 2008 if the trend exhibited by the data continues?

A 189 feet
B 205 feet
C 253 feet
D 312 feet

3 How would you describe the correlation of the data in the figure?

A data has a strong correlation
B data has a weak correlation
C data has no correlation
D not enough data given to make a decision

4 The data represent the week number and the number of hours that Lana watched TV. If the following answer choices represent slope, which one could not approximate the slope of a line of best fit?

<table>
<thead>
<tr>
<th>Week</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours</td>
<td>3.5</td>
<td>5.1</td>
<td>5.8</td>
<td>6.1</td>
<td>5.7</td>
</tr>
</tbody>
</table>

A 1.6
B 0.7
C 1/2
D −1.6

5 A hot air balloon is descending at a rate of 23.7 feet per minute. If the height of the balloon is currently 2,007 feet, what will it be after 10.2 minutes?

A 23.7 feet
B 241.74 feet
C 1,765.26 feet
D 1,983.3 feet
Standards 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 the equation \( P = 2,134T + 8,186,268 \) predicts the population \( P \) of North Carolina beginning in 2001, what does the number 8,186,268 represent? \( T \) equals 0 in the year 2001.
A the year 2000 population  
B the year 2001 population  
C the year 2002 population  
D the yearly increase

7 Which two points define a line of best fit?
A \( A \) and \( C \)  
B \( D \) and \( C \)  
C \( A \) and \( D \)  
D \( F \) and \( E \)

8 Which answer best describes how to pick two points defining a line of best fit?
A pick any two points and draw a line  
B approximately half of the other points lie above the line and half the points lie below the line  
C all of the other points lie above the line  
D all of the other points lie below the line

9 The equation \( H = -167^2 + 35 \) models the height of a dropped object. \( T \) is the time the object has been falling. \( H \) is the height in feet of the object at any given time. How high is the object if it has been falling for 1.1 seconds?
A 35.74 feet  
B 19.08 feet  
C 15.64 feet  
D -16.23 feet

10 The data represent the elevation and maximum normal temperature in January of five U.S. cities. Graph the elevation on the \( x \)-axis and the temperature on the \( y \)-axis. What is the correlation among the data?

<table>
<thead>
<tr>
<th>City</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevation (ft)</td>
<td>7</td>
<td>40</td>
<td>20</td>
<td>30</td>
<td>43</td>
</tr>
<tr>
<td>Temperature (°F)</td>
<td>75</td>
<td>60</td>
<td>43</td>
<td>36</td>
<td>31</td>
</tr>
</tbody>
</table>

A there is a very strong positive correlation  
B there is a very strong negative correlation  
C there is a slight positive correlation  
D there is a slight negative correlation
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.

**OBJECTIVE 4.02 (continued)**

11 The equation \( D = 7T \) models how many miles Frank can run in an hour.

How far can Frank run in 3.25 hours?

A 7 miles  
B 10.25 miles  
C 21 miles  
D 22.75 miles

12 Each year Melba wrote down her age and her height. Which is the dependent variable?

A year  
B height  
C Melba’s age  
D no dependent variable

13 The data graphed represent the number of storms Kinston experienced in a few selected years. If the trend continued, about how many storms would you estimate took place in the year 2000?

A 11 storms  
B 14 storms  
C 17 storms  
D 22 storms

14 At the local movie theater, the more people who attend a movie, the longer it stays in town. If the data for attendance and time the movie stays at the theater were graphed and a line of best fit were found, which of the following would describe the slope of the line?

A 0  
B positive  
C no slope  
D negative

15 How would you interpret the fourth point falling on the horizontal axis?

A The point furthest to the right is always on the horizontal axis.  
B Of the four given months, April is the last one.  
C No snow fell in the month of April.  
D In any scatter plot at least one point must be on the horizontal axis.
Standards 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.

OBJECTIVE 4.02 (continued)

16 The town’s population is now 2,051. If it grows 175 persons per year, about how long will it take for the population to exceed 5,540?  
A 6 years  B 10 years  C 20 years  D 25 years  

17 The table indicates the average cost, in millions of dollars, to make a movie in a few selected years. Which is a reasonable estimate for the average cost of making a movie in the year 2004?  

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Cost (million $)</td>
<td>18</td>
<td>27</td>
<td>29</td>
<td>34</td>
<td>48</td>
</tr>
</tbody>
</table>

A $68  B $57  C $44  D $35

18 Listed in order below are five jobs held by one person over time, and the hourly pay for each. What correlation is there between the jobs and the pay?  

<table>
<thead>
<tr>
<th>Job 1</th>
<th>Job 2</th>
<th>Job 3</th>
<th>Job 4</th>
<th>Job 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>$2.50</td>
<td>$4.35</td>
<td>$4.15</td>
<td>$5.95</td>
<td>$6.10</td>
</tr>
</tbody>
</table>

A there is a positive correlation  
C there is no correlation  
C there is a slightly negative correlation  
D not enough data to determine a correlation

19 Matiana’s mom created the equation \( S = 20T + 10 \) to predict Matiana’s score on her next 100 point math test based on the number of hours Matiana studies. If the equation works and Matiana studies for 2.75 hours \( T \) what will be her score \( S \)?  
A 100 points  B 75 points  C 65 points  D 50 points

20 The table gives Rhonda’s per game basketball scoring averages. How can the correlation between her grade level and scoring average be described?  

<table>
<thead>
<tr>
<th>Grade</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Score</td>
<td>9</td>
<td>11</td>
<td>10</td>
<td>12</td>
<td>8</td>
</tr>
</tbody>
</table>

A there is a strong negative correlation  
B there is no real correlation  
C there is a positive correlation  
D in 11th grade Rhonda’s scoring average will definitely increase
Standards 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.

OBJECTIVE 4.02 (continued)

21 Based on some old data in a family album, Max decided to graph his height over the years and look for a trend. What would be the independent variable?
A weight
B height
C increase in weight over the year
D year

22 What would be the dependent variable in Question 21?
A height
B weight
C increase in weight over the year
D year

23 Marco graphed the Raleigh temperatures during the months of April, May, June, and July. He noticed that the graph of the temperatures appeared to be following a particular pattern. What might be true about the slope of this line?
A There is no slope.
B The slope is negative.
C No pattern could possibly exist.
D The slope is positive.

24 The following dollar amounts represent the average price of a gallon of milk over a five-year period. If the line of best fit were found, which slope would be reasonable for that line?

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Year 4</th>
<th>Year 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1.05</td>
<td>$1.20</td>
<td>$1.35</td>
<td>$1.45</td>
<td>$1.57</td>
</tr>
</tbody>
</table>

A 20
B \( \frac{4}{3} \)
C \( \frac{1}{10} \)
D \(-5\)

25 The graph shows Cherrie's height at two-year intervals. If the trend in Cherrie's growth continues, which is the best prediction for Cherrie's height at age 14?
A 6 feet, 4 inches
B 5 feet, 10 inches
C 5 feet, 1 inch
D 4 feet, 11 inches
1 Chloe looked at the data and said, “The median is 37.” Which answer points out Chloe’s mistake?
38, 42, 51, 55, 37, 57, 34, 44, 56
A Chloe should have added the numbers and divided by 9. The median is 46.
B Chloe did not make a mistake; the mean is 37.
C Chloe forgot to arrange the numbers in ascending order. The median is 44.
D The median is the number which appears the most; there is no mean.

2 Bruce, Lola, Sheehan, Lakesha, and Mickey have 36, 48, 40, 61, and 312 stamps in their respective collections. Which measure of central tendency best represents the number of stamps in their collections?
A mean
B median
C mode
D mean or the mode

3 The bar graph shows the monthly number of sunny days from December through May. Which answer misrepresents the data?

A May and April had approximately the same number of sunny days.
B April had a few more sunny days than May.
C January and February had the least numbers of sunny days.
D January and February had almost no sunny days.

4 Sonoma, Metta, Frankie, and Will went fishing on Lake Waccamaw, each catching the indicated number of fish. When calculating the average fish catch, which number would skew the mean the most?
Sonoma: 5, Metta: 1, Frankie: 17, Will: 8
A 17 fish
B 8 fish
C 5 fish
D 1 fish
Standards 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.

OBJECTIVE 4.03 (continued)

5 Dalton polls students in one of three 8th grade lunch periods, asking how they feel about changing the name of the school’s mascot. Which answer best reflects the possible error in his polling method?
   A Polls should never be taken during lunch period.
   B If the lunch period was only 8th graders, it would not reflect the entire school’s opinion.
   C Students have no business taking polls.
   D Eighth graders are a representative sample of the school’s population; therefore, the poll was appropriate.

6 Martin was told to conduct a random sample of students at the high school. He sampled the 3rd period junior P.E. class. Why isn’t this a random sample?
   A No one class can provide a random sample for any purpose.
   B This class was made up of only the juniors who were scheduled into third period. They may not be representative of the junior class or of the entire school.
   C Martin must include at least one other class, in particular, either the freshman class or the sophomore class.
   D Most students in P.E. will not stop their activity long enough to answer Martin’s question with any thought.

7 Kelli was to determine the average height of the female population in her school. She used the roster of the school’s girls’ basketball team. What is wrong with this approach?
   A Basketball rosters always exaggerate the heights of their team.
   B Basketball team members probably tend to be taller than the average.
   C She should have picked at least one other sport team roster to include.
   D She should have included some boys in the sample population.

8 Why is 0 not the mode of the data?
   -15, -7, -7, 0, 1, 14, 21
   A 21 is the mode; it is biggest
   B 0 does not appear most often.
   C It is the mode.
   D -15 is the mode; it is the smallest
Standards 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.

OBJECTIVE 4.03 (continued)

The two bar graphs represent the results of a survey to determine the students’ favorite teacher. Use the figures to answer Questions 9–12.

9 Using Graph 2, which teacher received twice as many votes as Mr. T?  
A Ms. P  
B Mr. D  
C No one received twice as many votes.  
D Ms. B

10 Why might Ms. B prefer Graph 2 over Graph 1?  
A Graph 2 starts at 20, while Graph 1 starts at 0.  
B She really has no reason to prefer Graph 2 over Graph 1.  
C Since Ms. B has the most votes, the differences in Graph 2 appear greater.  
D Graph 1’s maximum vertical scale is 50, while Graph 2’s maximum vertical scale is 40.

11 Why is Graph 1 less misleading than Graph 2?  
A Graph 2 does not show the complete bar lengths.  
B Graph 1 scale starts at 0.  
C Graph 1 was the first Graph drawn by the students, and the first Graph is always the best one to use when displaying data.  
D Graph 1 reflects the narrow range of the voting.

12 Why do the bar height differences in Graph 2 appear to be greater?  
A Since the vertical scale does not start at 0, Graph 2 gives the impression that Ms. B was overwhelmingly the students’ favorite teacher.  
B The differences would not appear to be so great if the scale went by 5’s rather than by 10’s.  
C Graph 1’s maximum vertical scale is 50, while Graph 2’s maximum is only 40. This is the main reason for the difference in heights.  
D Since the voting for each teacher was different, Graph 2’s bars reflect this accurately.
Standards 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.

OBJECTIVE 4.03 (continued)

13 On TV, we often hear advertisers say four out of five doctors recommend the product being advertised. Which answer provides the best reason to be cautious about what the advertiser is telling the viewer?

A Doctors do not tell the truth.
B They did not ask your family doctor.
C They may have surveyed only doctors who had received free samples of the product.
D Advertisers are always trying to mislead the viewer and should never be trusted.

14 Former presidents James Polk and Andrew Johnson were both born in North Carolina. What is wrong with the people of North Carolina thinking that their state’s contribution to the presidency is twice as important as that of any state producing only one president?

A This would be an accurate assumption on the part of the citizens of North Carolina.
B One cannot place the value of a state’s contributions to the presidency by simply counting the number of presidents born in that state.
C No state in the union had only one president born in their state.
D All presidents have an equal impact on the American culture.

15 Desrai polled her third period dance class to determine the student population’s interest in having a dance on Saturday. What was the flaw in her polling method?

APolls should only be taken at the end of the school day.
BDesrai should have included the students in her 4th period math class.
CStudents who take dance are probably more interested in dancing than the overall student body.
DDesrai should have polled at least a few more classes that she is enrolled in to obtain a better sample of the student body.
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.

**OBJECTIVE 4.03** (continued)

16 Margaret surveyed her classmates to find out how many of them were born in December. The list below shows her survey results. What is the mode of the data?

3, 11, 15, 7, 24, 29, 11, 21, 17, 18, 10, 24

A 11  
B 16  
C 24  
D 11 and 24

17 What is the median of the data in Question 16?

A The median is 17.  
B The median is 16.  
C The median is 15.  
D The median is the average of 29 and 11.

Two groups of three girl scouts teamed up to sell cookies. The circle graphs show their sales. Use the circle graphs to answer Questions 18–20.

18 Who sold the most cookies?

A Lisa and Beth  
B Sheri and Kim  
C Val, Beth, and Susan  
D It is impossible to tell.

19 Is it possible for Sheri to have sold more cookies than either Val, Beth, or Susan?

A Yes  
B No, since Sheri’s section is small.  
C Yes, but only if Sheri had help.  
D It is impossible to tell whether it is possible

20 What is misleading about the circle graphs?

A We need to know how many cookies each team sold before deciding who sold the most.  
B The fact that Val’s, Susan’s and Beth’s slices appear the same causes confusion.  
C If Sheri’s section were bigger, there would be no confusion when answering a question concerning the number of boxes sold.  
D Circle graphs are never a good way to display data.
Standards 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.

**OBJECTIVE 5.01** Develop an understanding of function.
- Translate among verbal, tabular, graphic, and algebraic representations of functions.
- Identify relations and functions as linear or nonlinear.
- Find, identify, and interpret the slope (rate of change) and intercepts of a linear relation.
- Interpret and compare properties of linear functions from tables, graphs, or equations.

1 Which equation is not linear?
   A  $2x + 3y = 12$
   B  $y = -7$
   C  $2x + x^2 = 5$
   D  $y = \frac{2}{3}x - 5$

2 The relationship between the number of sides of a polygon $n$ and the sum of its interior angle measures $s$ can be represented by the equation for a line. Use the data to find the linear relationship. What is the sum of the interior angles of a decagon? *(Hint: A decagon is a 10-sided polygon.)*

<table>
<thead>
<tr>
<th>Polygon</th>
<th>Triangle</th>
<th>Quadrilateral</th>
<th>Heptagon</th>
<th>Octagon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Sides</td>
<td>3</td>
<td>4</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Sum of Measures of Interior Angles</td>
<td>$180^\circ$</td>
<td>$360^\circ$</td>
<td>$900^\circ$</td>
<td>$1,080^\circ$</td>
</tr>
</tbody>
</table>

A  2,340  B  1,800  C  1,440  D  540

3 A homeowner’s monthly telephone bill can be calculated using $b = 0.08m + 32.50$ where $m$ is the number of minutes the phone is used each month. Whether a customer uses the phone or not, there is a monthly fee. What is this monthly fee?
   A  $112.50  B  $40.50  C  $32.58  D  $32.50

4 The table reflects the gold-winning Olympic high jump performance over the years, in inches. What can probably be said about the winning performance in the year 1996?

<table>
<thead>
<tr>
<th>Year</th>
<th>1896</th>
<th>1912</th>
<th>1920</th>
<th>1948</th>
<th>1952</th>
<th>1984</th>
<th>1992</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>71.25</td>
<td>76</td>
<td>76.25</td>
<td>78</td>
<td>80.32</td>
<td>92.5</td>
<td>92</td>
</tr>
</tbody>
</table>

A  It was less than or equal to 92 inches.
B  It was under 88 inches.
C  It was in the range 90—95 inches.
D  It was exactly 93 inches.
Standards 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.

**OBJECTIVE 5.01** (continued)

5. What can be said about data that can be represented by a line with a positive slope?
   - A. The data is decreasing.
   - B. The data is inconsistent.
   - C. All of the data must be integers.
   - D. The data is increasing.

6. If DVD rental pricing is linear, how much does one DVD cost to rent?

<table>
<thead>
<tr>
<th>DVDs Rented</th>
<th>12</th>
<th>19</th>
<th>34</th>
<th>47</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Bill</td>
<td>$45</td>
<td>$71.25</td>
<td>$127.50</td>
<td>$176.25</td>
</tr>
</tbody>
</table>

   - A. $45
   - B. $26.25
   - C. about $4
   - D. $3.75

7. Alex deposits $1,500 in a new savings account at 2% interest. The equation \( S(t) = 1,500(1.02)^t \) gives total savings \( S \) in the savings account at the end of \( t \) years. How much money will Alex have in his account after 5 years?
   - A. $1,502
   - B. $1,656.12
   - C. $1,682.43
   - D. $150,510

8. The data listed is supposed to be able to be represented by a line with a slope of \( \frac{2}{3} \). Which point does not belong?
   - (4, 4), (25, 18), (1, 2), (12, 14), (10, 8)
   - A. (4, 4)
   - B. (12, 14)
   - C. (10, 8)
   - D. (25, 18)

9. Identify the slope of \( 8x - 3y = 12 \) without graphing the line.
   - A. \( -\frac{8}{3} \)
   - B. \( \frac{3}{8} \)
   - C. \( \frac{8}{3} \)
   - D. 12

10. Bev can get a discount on daily swimming pool fees if she pays a yearly surcharge fee. Bev estimates she will use the pool at least 30 times this summer. The equation \( C(n) = 2n + 50 \) can be used to predict the cost \( C \) of swimming over the summer, based on the number \( n \) of times she uses the pool. What does the number 50 represent?
   - A. total cost for Bev to use the pool
   - B. daily fee
   - C. number of days Bev swims
   - D. yearly surcharge fee
Standards 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.

OBJECTIVE 5.01 (continued)

11 Crickets make their chirping sounds by rapidly sliding one wing over the other. Scientists have noticed that the warmer the weather, the faster they move their wings. The graph relates the number of chirping sounds per second to temperature in degrees Fahrenheit. What is the domain?
   A {76, 83, 84, 88}
   B the crickets themselves
   C the point (20, 88)
   D {14, 16, 18, 20}

12 The data from Question 11 are ordered pairs in the form (Temperature, Chirps per Second). What is the range of these data?
   A {14, 16, 18, 20}
   B the crickets themselves
   C the point (88, 20)
   D {76, 83, 84, 88}

13 A health club charges an annual membership fee plus five dollars per visit. The data, which can be represented by the formula for a line, compares the yearly cost $C$ of attending the club based on the number of visits $V$. What does the $C$-intercept represent?
   A The $C$-intercept represents the annual membership fee.
   B The data has to have a starting place and the point graphed is as good a place to start as any.
   C Since each visit costs $5, after 4 visits the cost would be $20, thus the starting point of 20.
   D The $C$-intercept has nothing to do with this problem.

14 Can the relationship between age to adulthood and height be expressed by a linear equation?
   A Yes
   B There is no relationship between age and height.
   C No, since some children die in infancy.
   D No, since as a person gets older, his/her growth rate slows down.
Standards 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.

OBJECTIVE 5.01 (continued)

15 A museum has an interactive exhibit on U.S. mountains. Entering a natural number $n$ causes it to speak the name of the $n$th highest mountain in the United States. Entering number 16 causes it to say Mt. Mitchell. This exhibit models a function. What is the domain?
   A the numbers entered
   B the interactive exhibit
   C the name of the mountains
   D the museum

16 What is the range of the function described in Question 15?
   A the interactive exhibit
   B the number Toby enters
   C the names of the mountains
   D the museum

17 Which graph appears to have an undefined slope?

18 Which graph from Question 17 appears to have a negative slope?
   A Graph 1
   B Graph 2
   C Graph 3
   D Graph 4

19 Which graph from Question 17 appears to have a slope of zero?
   A Graph 1
   B Graph 2
   C Graph 3
   D Graph 4

20 What is the range of the function?
   A $G$
   B $\left\{8, -4, \frac{1}{2}\right\}$
   C $\{4, -3\}$
   D $\left\{8, -4, \frac{1}{2}, 4, -3\right\}$
While hiking up a hill, Pedro noticed that every \( \frac{1}{2} \) hour his elevation changed by 150 feet. What is the slope of this linear relationship?

A \( \frac{1}{2} \)  
B \( \frac{75}{1} \)  
C \( \frac{150}{1} \)  
D \( \frac{300}{1} \)

When visiting Carolina Beach State Park, Caitlin likes to take her time, so she takes the scenic route. If she travels 45 miles in 1 hour and 15 minutes, at what rate is she traveling?

A 0.75 mile per second  
B 36 miles per hour  
C 50 miles per hour  
D 60 miles per hour

Which answer gives the \( x \)-intercept and \( y \)-intercept of the linear equation \(-3x + 5y = 30\)?

A \((-10, 0)\) and \((0, 6)\)  
B \((0, -10)\) and \((0, 6)\)  
C \((-10, 0)\) and \((6, 0)\)  
D \((0, -10)\) and \((6, 0)\)

Which is a nonlinear function?

A \(2x + 2y = 9\)  
B \(y = 5x - 2\)  
C \(y = 8\)  
D \(y = 6x^2 - 10\)

Which is the graph of a linear function?

A  
B  
C  
D
Standards 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.

OBJECTIVE 5.02 Write an equation of a linear relationship given: two points, the slope and one point on the line, or the slope and y-intercept.

1 Which is an equation of the line with slope $-3$ and y-intercept 4?  
   A $y = -3x + 4$  
   B $y = 4x - 3$  
   C $-3x + 4y = 12$  
   D $y - 4 = x + 3$

2 Which is an equation of the line with slope 5 and y-intercept $-2$?  
   A $5x + y = 2$  
   B $2x - y = 5$  
   C $5x - y = 2$  
   D $2x + y = 5$

3 Which is an equation of the line with slope $-\frac{3}{5}$ and y-intercept 0?  
   A $5y + 3x = 0$  
   B $3y + 5x = 0$  
   C $y = 0x - \frac{3}{5}$  
   D $x = \frac{3}{5}$

4 Which is an equation of the line with slope $-6$ passing through the point $(-2, 4)$?  
   A $y = -6x - 8$  
   B $y = -6x + 22$  
   C $y = -6x + 4$  
   D $-6y - 2x = 4$

5 Which is an equation of the line with slope $-\frac{2}{3}$ passing through the point $(10, 0)$?  
   A $y = -\frac{2}{3}x - 10$  
   B $2x + 3y = 10$  
   C $y + 10 = -2x$  
   D $y = -\frac{2}{3}x - \frac{20}{3}$
Standards 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.

OBJECTIVE 5.02 (continued)

6 Which is an equation of the line with slope \(-\frac{3}{4}\) passing through the point \((-2, -10)\)?

A \(y = -\frac{3}{4}x - \frac{23}{2}\)  
B \(y = -\frac{3}{4}x - \frac{19}{2}\)  
C \(y = -\frac{3}{4}x - 10\)  
D \(3x - 4y = 23\)

7 Which is an equation of the line with slope \(\frac{1}{2}\) passing through the point \((8, -6)\)?

A \(x = \frac{1}{2}y + 8\)  
B \(y = \frac{1}{2}x - 6\)  
C \(y = \frac{1}{2}x + 11\)  
D \(y = \frac{1}{2}x - 10\)

8 Which is an equation of the line containing the points \((-1, 4)\) and \((6, 3)\)?

A \(y = x + 5\)  
B \(y = -\frac{1}{5}x + \frac{21}{5}\)  
C \(y = -7x - 3\)  
D \(y = -\frac{1}{7}x + \frac{27}{7}\)

9 Which is an equation of the line containing the points \((10, 6)\) and \((-12, 28)\)?

A \(y = -x + 16\)  
B \(y = -x + 6\)  
C \(y = x - 4\)  
D \(y = 6\)

10 Which is an equation of the line containing the points \((7, 8)\) and \((5, 8)\)?

A \(y = 0\)  
B \(x = 2\)  
C \(y = 8\)  
D \(x = 8\)

11 Which is an equation of the line containing the points \((4, -2)\) and \((4, -12)\)?

A \(x = 0\)  
B \(y = 0\)  
C \(x = 4\)  
D \(y = -2\)
Standards 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.

**OBJECTIVE 5.02 (continued)**

12 Which is an equation of the line containing the point \((10, -6)\) and having undefined slope?

- **A** \(x = 10\)
- **B** \(y = -6\)
- **C** \(y = 0\)
- **D** \(y = -\frac{3}{5}x\)

13 Which is an equation of the line containing the points \((-3, 6)\) and \((-3, -1)\)?

- **A** \(y = 5\)
- **B** \(x = 0\)
- **C** \(y = 6\)
- **D** \(x = -3\)

14 Which is an equation of the line in the figure?

- **A** \(3x + 4y = 0\)
- **B** \(4x + 3y = 0\)
- **C** \(4x + 3y = 12\)
- **D** \(3x + 4y = 12\)

15 Which is an equation of the line shown in this graph?

- **A** \(y = 4\)
- **B** \(x = 4\)
- **C** \(x + y = 4\)
- **D** \(y = 4x\)
Standards 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.

OBJECTIVE 5.02 (continued)

16 Which is an equation of the line shown in this graph?  

A  $x = -3$  
B  $y = -3$  
C  $x + y = -3$  
D  $y = -3x$

17 Which is an equation of the line containing the points $(0, 6)$ and $(-3, 0)$?  

A  $y = 2x$  
B  $y = \frac{1}{2}x$  
C  $y = 2x + 6$  
D  $y = \frac{1}{2}x + 6$

18 Which is an equation of the line with slope 3 containing the point $(2, 0)$?  

A  $y = 3x - 6$  
B  $y = 3x + 2$  
C  $2x + 3y = 6$  
D  $3x = 2y$

19 Which is an equation of the line with slope 1 containing the point $(-1, 0)$?  

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

20 Which is an equation of the line containing the points $(0, -4)$ and $(-2, 0)$?  

A  $y = -2x$  
B  $y = -\frac{1}{2}x$  
C  $y = -2x - 4$  
D  $y = -\frac{1}{2}x - 2$
Standards 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.

OBJECTIVE 5.02 (continued)

21 The population of Fayetteville was about 121,000 in 2000 and about 130,000 in 2003. If the population increases at a linear rate, in $x$ years after 2000 which equation gives the population $y$?

A $y = 3,000x + 121,000$

B $y = 9,000x$

C $y = 3,000x$

D $y = 9,000x + 130,000$

22 Which is an equation of the line containing the points (1.6, 2.5) and (4.4, 8.1)?

A $y - 2.5 = 2(x - 1.6)$

B $y - 1.6 = 2(x - 2.5)$

C $y - 2.5 = \frac{1}{2}(x - 1.6)$

D $y - 1.6 = \frac{1}{2}(x - 2.5)$

23 A business purchases a computer for $2,000. The value of the computer depreciates $400 per year. Which linear equation gives the value $y$ of the computer after $x$ years?

A $y = 400x + 2,000$

B $y = 2,000x - 400$

C $y = 2,000x + 400$

D $y = -400x + 2,000$

Use the following information to answer Questions 24 and 25.

Buford’s salary was $30,000 in 2001 and $36,000 in 2004. Assume his salary follows a linear pattern.

24 Which equation gives Buford’s salary $y$ in $x$ years after 2001?

A $y = 2,000x + 30,000$

B $y = 3,000x + 36,000$

C $y = 30,000 = 2,000(x - 2001)$

D $y = 30,000 - 2,000x$

25 If this trend continues, what will Buford’s salary be in 2010?

A $\$54,000$

B $\$48,000$

C $\$42,000$

D $\$38,000$

26 If there were about 6,700 students at Western Carolina University in 2000 and the enrollment goes up approximately 150 students per year, which equation gives the enrollment $y$, in $x$ years after 2000?

A $y = 150x + 6,700$

B $y = 6,850x$

C $y = 6,700x + 150$

D $y = 150x + 7,000$
OBJECTIVE 5.03 Solve problems using linear equations and inequalities; justify symbolically and graphically.

1. Suppose that on a given day the temperature in Forest City was rising linearly as shown in the graph. If this trend continued for a few hours, what would the temperature be at 2 P.M.?
   A 79 degrees  
   B 82 degrees  
   C 85 degrees  
   D 88 degrees

2. Triple A Carpets charges $320 plus $15 per hour for labor, while Triple B Carpets charges $400 plus $10 per hour for labor. What is the number of hours such that the cost of laying carpeting by either company is the same?
   A 48 hours  
   B 28.8 hours  
   C 32 hours  
   D 16 hours

Use the following information to answer Questions 3 and 4.

The cost of having mouse pads made with a picture of the Outer Banks and the company logo on them is $30 plus $4 for each pad.

3. Which is the graph of this situation?
   A  
   B  
   C  
   D

4. How much would it cost to have 10 mouse pads printed?
   A $70  
   B $50  
   C $40  
   D $30
Standards 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.

**OBJECTIVE 5.03** (continued)

5 Reyna was solving $5x + 2 = 12$. She graphed $y = 5x + 2$ and $y = 12$ on her graphing calculator as shown in the figure and examined the graph to find the $x$-coordinate of the point of intersection. What was her solution?

- A 1
- B 2
- C 5
- D 12

6 Which graph shows how many of each kind of loan the loan officer can complete in a given day? Let $x$ be the number of car loans and $y$ the number of home equity loans.

- A
- B
- C
- D

7 Which is a possible solution of Question 6?

- A 1 car loan, 4 home equity loans
- B 2 car loans, 6 home equity loans
- C 4 car loans, 4 home equity loans
- D 6 car loans, 1 home equity loan

8 The figure shows a hill. When you are 6 feet from the bottom of the hill, how high are you?

- A 2 feet
- B 3 feet
- C 5 feet
- D 8 feet
9 Mileage from Columbia to Asheville by way of Charlotte and Hickory is 190 miles. The distance from Charlotte to Hickory is \( x \) miles. What is the distance from Columbia to Charlotte?

- A 80 miles
- B 70 miles
- C 40 miles
- D 20 miles

10 Increasing the area of a rectangle by 10 is the same as reducing its area by 10 and then multiplying the result by 3. What is the area of the rectangle?

- A 10 square units
- B 20 square units
- C 60 square units
- D 120 square units

11 Lisa buys a sweater at 30% off the retail price and a pair of shoes at 50% off the retail price. The retail price of the shoes was three times that of the sweater. Her total bill was $90. What was the retail price of the shoes, to the nearest dollar?

- A $25
- B $50
- C $75
- D $123

12 Mr. and Mrs. Hertz’ budget for a surprise party they are throwing for their daughter is $1,170. The catering company charges $585 plus $6.50 per guest. Which inequality expresses the maximum number of guests they can invite to the party?

- A \( 6.50g + 585 \leq 1,170 \)
- B \( 6.50g - 585 \leq 1,170 \)
- C \( 6.50g - 585 \geq 1,170 \)
- D \( 6.50g + 585 \geq 1,170 \)

13 Cashews are 50% off, peanuts are 20% off, walnuts are 60% off. Aubrey bought twice as many pounds of peanuts as cashews, three times as many pounds of walnuts as cashews, and spent $18.90. How many pounds of cashews did Aubrey buy? The table shows the pre-discount prices.

<table>
<thead>
<tr>
<th>Nuts</th>
<th>Peanuts</th>
<th>Cashews</th>
<th>Walnuts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost per Pound</td>
<td>$1.50</td>
<td>$3.00</td>
<td>$2.00</td>
</tr>
</tbody>
</table>

- A 4.5 pounds
- B 4 pounds
- C 3 pounds
- D 2 pounds
Standards 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.

**OBJECTIVE 5.03** (continued)

14 The lines \(x = 4, x = 19, y = -7,\) and \(y = 13\) intersect to form a rectangle. What is the area of the resulting rectangle?

A  90 square units  
B  138 square units  
C  300 square units  
D  460 square units

15 Bernadett scored 25, 33, 22, and 18 points in 4 basketball games. How many points must Bernadett score in her next game to achieve a 28 point per game average?

A  14 points  
B  42 points  
C  98 points  
D  126 points

16 Dr. Shils saw 250 patients. Four times as many patients had colds as did patients who came in with the flu. The remaining 14% saw Dr. Shils for other reasons. How many patients came in because they had a cold?

A  264 patients  
B  172 patients  
C  43 patients  
D  35 patients

17 Mr. Swanson’s payment plan for his $31,372 new car is quite unusual. His second monthly payment will be double his first. The third will be double the second, and so on. It will take five months to pay for the car. How much will be the second payment?

A  $506  
B  $1,012  
C  $2,024  
D  $8,096

18 In 2001 the U.S. population was approximately 285,000,000 people; North Carolina accounted for approximately 2.85% of the total. If 12% of North Carolina’s population was 65 years or older, how many people in North Carolina were in this age group?

A  34,200,000  
B  9,747,000  
C  7,980,000  
D  974,700

19 The sum of a number and 48 is decreased by twice the number, resulting in an answer that is five times the original number. What is the original number?

A  6  
B  8  
C  12  
D  24
Standards 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.

OBJECTIVE 5.03 (continued)

20 Electricity is sold to the consumer in kilowatt hours (kwh). Consider the two companies and each of their sales plans. Which inequality indicates the range of kwh which would cost less if purchased from Company A?

| Company A | $35 + $0.08 per kwh |
| Company B | $0.12 per kwh |

A  $k > 875   B  $k \geq 35
C  $k > 35   D  $k \leq 875

21 The area of circle 1 is $10\pi$ less than three times the area of circle 2, while the radius of circle 3 is 20 units. If the area of each of the three circles is found using the same units of measure and the sum of the areas of all three circles is $790\pi$, what is the area of circle 2?

A  $780\pi$ square units   B  $390\pi$ square units
C  $100\pi$ square units   D  $10\pi$ square units

22 Paul left his house on a bicycle at 8:00 A.M. pedaling at 5 miles per hour. Two hours later his sister, Annie, left their house on a bicycle pedaling at 7 miles per hour. If Annie follows the same route as Paul, when will she catch up?

A  3:00 P.M.   B  3:00 A.M.
C  7 hours   D  She will not catch up

23 Billy Joe and Missy both bought the same bicycle. Billy Joe paid $112 less than 3 times the price that Missy paid for her bicycle. If the price Missy paid for her bicycle was half the price that Billy Joe paid, how much did Missy’s bicycle cost?

A  $336   B  $224
C  $112   D  $66

24 Five less than three times a number equals ten less than four times the number. What is the number?

A  15   B  10
C  5   D  1

25 A CD player repair bill is $79.50. The labor cost was twice that of the cost of parts, and there is a 6% tax on the total. How much was the tax?

A  $50   B  $25   C  $4.50   D  $4.00
Standards 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.

**OBJECTIVE 5.04** Solve equations using the inverse relationships of addition and subtraction, multiplication and division, squares and square roots, and cubes and cube roots.

1. Jordan wanted to fence in her flower bed and garden, and also separate the garden from the flower bed with a fence. What is the least amount of fencing she needs to purchase to do the job?

- A. 350 feet
- B. 280 feet
- C. 270 feet
- D. 170 feet

2. Solve $2L + 2W - P = 0$ for $W$.

- A. $W = 2L + P$
- B. $W = P - 2L$
- C. $W = \frac{1}{2}(2L - P)$
- D. $W = \frac{1}{2}(P - 2L)$

3. What number can be cubed and then multiplied by 0.01 with the result being 0.08?

- A. 8
- B. 2
- C. 0.2
- D. 0.02

4. Jillian is making costumes for the play. Each costume will take 3.5 yards of material. There are two bolts of material, each 35.5 yards long. How many costumes can Jillian make?

- A. 35 costumes
- B. 21 costumes
- C. 20 costumes
- D. 10 costumes

5. A cat is at the top of a 26-foot tree. The top of a ladder needs to rest against the tree 2 feet below the cat, and the base of the ladder must be placed 7 feet from the base of the tree. How long must the ladder be to rescue the cat?

- A. 31 feet
- B. 25 feet
- C. 24 feet
- D. 7 feet
Standards 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.

OBJECTIVE 5.04 (continued)

6 The moon is a sphere with a surface area of $4,668,868\pi$ square miles. If the surface area of a sphere is $4\pi r^2$, what is the radius of the moon to the nearest whole number?

A 4,668,868 miles  
B 1,167,217 miles  
C 1,080 miles  
D 40 miles

7 Conrad belongs to a CD of the month club. In August he buys 10 more CDs costing $5 a piece than the number of CDs he buys costing $9.95 a piece. If his bill comes to $154.65, how many $5 CDs did he buy?

A 27 CDs  
B 17 CDs  
C 7 CDs  
D 2 CDs

8 What is the length of $\overline{AC}$?

A 10  
B 7  
C 6  
D 5

9 The formula $V = 8\sqrt{h}$ is used to relate the velocity and bar height in pole-vaulting. If a pole vaulter’s velocity $V$ is 32 feet per second, what is the height the pole-vaulter will reach?

A 19 feet  
B 16 feet  
C 14 feet  
D 12 feet

10 If Ted, Michael, and Andrew add all of their ages together, the sum is 114. Ted is the oldest, Michael is two years younger than Ted, and Andrew is a year younger than Ted. How old is Andrew?

A 50 years old  
B 38 years old  
C 27 years old  
D 13 years old
Standards 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.

**OBJECTIVE 5.04 (continued)**

11 This prism has a volume of 92.3 cubic centimeters. What is the height $h$?  

![](prism.png)

- A 13.6 centimeters
- B 8.4 centimeters
- C 2 centimeters
- D 0.6 centimeter

12 A piggy bank contains 220 pennies, 75 nickels, 112 dimes, and some quarters. The total amount of money is $23.90. How many quarters are in the piggy bank?  

- A 11 quarters
- B 19 quarters
- C 27 quarters
- D 42 quarters

13 Monty is 23. If 4 is subtracted from Turner’s age cubed, the result would be Monty’s age. How old is Turner?  

- A 27 years old
- B 19 years old
- C 11 years old
- D 3 years old

14 You have $900 in savings and are adding $15 per week to your savings. Your friend has $2,300 in savings but decides to spend $20 per week. How long will it be until the two savings accounts have equal balances?  

- A 40 weeks
- B 35 weeks
- C 20 weeks
- D 15 weeks

15 You have a balance beam, a 100-ounce weight, and 8 identical marbles. The total weight of all of the marbles equals $w$. Which answer mathematically represents the equality shown in the figure?  

![](marbles.png)

- A $2w = 100$
- B $w = 50$
- C $\frac{1}{4}w = 100$
- D $4w = 100$
Standards 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.

**OBJECTIVE 5.04** (continued)

16 Amanda and Phyllis live 54 miles apart. On Saturday they decide to bicycle towards one another until they meet. Phyllis leaves at 8:00 A.M. and travels at 10 miles per hour. Amanda leaves an hour later and travels at 12 miles per hour. When they meet, how far has Amanda traveled?

A 40 miles  
B 37 miles  
C 30 miles  
D 24 miles

17 A speeding ticket fine is $45 for court costs and $12 for each mile per hour over the speed limit. If a driver received a speeding ticket costing $273, how many miles per hour over the speed limit was she going?

A 5 miles per hour  
B 19 miles per hour  
C 23 miles per hour  
D 25 miles per hour

18 Herbie planted a tomato plant. Thirty days later it was 16 inches tall. After that it grew $\frac{3}{8}$ inches each day. If the first 30 days are included, when will Herbie’s tomato plant be 26.125 inches tall?

A 70 days  
B 57 days  
C 30 days  
D 27 days

19 An automobile engine’s displacement $D$ can be found by the formula $D = 0.784b^2sn$, where $b$ is the bore, $s$ is the stroke, and $n$ is the number of cylinders. Which of the following shows the formula solved for $b$?

A $b = \sqrt[3]{\frac{D}{0.784sn}}$  
B $b = D - 0.784sn$  
C $b = 0.784 - sn$  
D $b^2 = D + 0.784sn$

20 A cone’s volume is 1,024 cubic inches, and its height is 110 inches. What is the radius of the cone to the nearest hundredth of an inch?

A 1,134 inches  
B 87.74 inches  
C 27.93 inches  
D 2.98 inches
Standards 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.

OBJECTIVE 5.04 (continued)

21 The Biltmore Estate in Asheville is the largest private house in the world, so large that when told how many rooms the estate has, most people find it impossible to believe. Solve the following equation to find the number of rooms $n$.

$$n^3 + 17 = 15,625,017$$

A 15 rooms B 175 rooms
C 250 rooms D 15,625 rooms

22 You have two lengths of rope. One rope length is 86 feet and the other is 13 feet. How many 15 inch pieces of rope can be cut from these two pieces of rope?

A 91 pieces B 79 pieces
C 78 pieces D 6 pieces

23 If you triple a number, square the result, and then increase that by 21, you get 462. What is the number?

A 144 B 16
C 12 D 7

24 A contractor is building a circular sidewalk 3 feet wide around a garden. The outside circumference of the sidewalk is twice the circumference of the garden. What is the radius $x$ of the garden?

A 3 feet B 6 feet
C 9 feet D 10 feet

25 A salesperson in an electronics store is given two choices as to how she can be paid. One plan offers $100 a week plus $15 for each electronic component sold. The second plan offers $50 a week plus $25 for each component sold. At what sales volume are the plans identical?

A 150 components B 50 components
C 10 components D 5 components
Sample Test

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 table indicates the approximate distance on a map from Raleigh to each of four other locations in North Carolina. Which answer presents these distances in descending order?

<table>
<thead>
<tr>
<th>City</th>
<th>Little Rock</th>
<th>Burnsville</th>
<th>Little Switzerland</th>
<th>Forest City</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance from Raleigh</td>
<td>(\frac{5}{8}) in.</td>
<td>(\frac{5}{2}) in.</td>
<td>(\frac{3}{4}) in.</td>
<td>(\frac{9}{16}) in.</td>
</tr>
</tbody>
</table>

A \(\frac{5}{16}, \frac{5}{8}, \frac{5}{4}, \frac{5}{2}\)  
B \(\frac{3}{4}, \frac{5}{8}, \frac{9}{16}, \frac{5}{2}\)  
C \(\frac{1}{2}, \frac{9}{16}, \frac{5}{8}, \frac{3}{4}\)  
D \(\frac{5}{2}, \frac{3}{4}, \frac{5}{8}, \frac{9}{16}\)

2. The table shows the debate team’s wins and losses during the last four years. Which answer is the range of the number of wins?

<table>
<thead>
<tr>
<th>Wins</th>
<th>11</th>
<th>8</th>
<th>13</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Losses</td>
<td>4</td>
<td>7</td>
<td>6</td>
<td>2</td>
</tr>
</tbody>
</table>

A 37  
B 18  
C 13  
D 8

3. Which of the five lines is a reasonable line of best fit for the points in the figure?

A \(\ell_4\)  
B \(\ell_3\)  
C \(\ell_2\)  
D \(\ell_1\)

4. What is a reasonable estimate for the product of 10,000,053 and 521?

A 52,100,000,000  
B 5,210,027,613  
C 5,210,000,000  
D 500,000,000

5. Cody measured the length of a desk using a dollar bill which he knew was about 6 inches long. If the desk was 10.5 dollar-bill lengths, approximately how many inches long is the desk?

A 10.5 inches  
B 16.5 inches  
C 60.5 inches  
D 63 inches

North Carolina End-of-Grade Test, Grade 8
6 The base of a 6-foot high pyramidal tent is a square with edges each measuring 5 feet. If those edge lengths doubled, by how many cubic feet would the tent’s volume increase?

A 50 cubic feet  
B 150 cubic feet  
C 200 cubic feet  
D 250 cubic feet

7 Quadrilateral $BCDE$ is the preimage of quadrilateral $B’C’D’E’$ under a dilation. Which is true about this dilation?

A The scale factor is greater than one.  
B The scale factor is less than one.  
C The scale factor is one.  
D The scale factor is less than zero.

8 Which point is the center of the dilation in the figure in Question 7?

A $X$  
B $U$  
C $V$  
D $W$ 

9 Describe the correlation shown in the diagram.

A The correlation is circular.  
B One cannot look at data points and decide on correlation.  
C There is no correlation.  
D The correlation is negative.

10 What is the median of the data?

A 12  
B 47  
C 57  
D 82
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 Which of the following four numbers is an irrational number?
   A $\sqrt{196}$      B $0.\overline{3}$
   C $9\frac{7}{8}$     D $\sqrt{82}$

12 Sierra identified the relationship $B = \frac{1}{3}F + 2$, between the number of hours when she is free to do whatever she wishes $F$ and the number of books she reads $B$. What is the number 2 in the equation?
   A Sierra always forces herself to read 2 more books.
   B Every equation must have a number added in at the end.
   C The 2 is not important; in fact, it really could be any number.
   D It is the number of books she reads even when she has no free time.

13 Lee, a Red Springs hog farmer, is building a new rectangular hog pen with dimensions 150 feet by 70 yards. A fence installed on a diagonal of the pen would be approximately how long?
   A 86 feet      B 133 feet
   C 166 feet     D 258 feet

14 What are the two missing numbers in the pattern?
   87, 94, 101, ____, ____, 122
   A 114 and 117   B 104 and 107
   C 107 and 114   D 108 and 115

15 Two cars begin at “Start.” One drives north, the other south. When one stops at $A$ and the other at $B$, approximately how far apart are they?
   A 180 miles
   B 134 miles
   C 80 miles
   D 60 miles

16 Seth bought a notebook for $2.31 and several pens costing $1.29 each. If the total bill is $16.50, how many pens did Seth buy?
   A 13 pens      B 11 pens
   C 10 pens      D 9 pens
17 Joanne has an old vase in the shape of a cone. She buys a smaller vase with a radius \( \frac{1}{4} \) that of the old one. How does the volume of the new vase compare with that of the old one?

A The new vase’s volume will be \( \frac{1}{16} \) that of the old one.

B The new vase’s volume will be \( \frac{1}{4} \) that of the old one.

C The vase’s volumes are equal since the height has not changed.

D The new vase’s volume will be 4 times that of the old one.

18 Based on the historical data, what was the likely 2004 Olympic gold medal performance?

<table>
<thead>
<tr>
<th>Year</th>
<th>1900</th>
<th>1912</th>
<th>1936</th>
<th>1960</th>
<th>1980</th>
<th>1992</th>
</tr>
</thead>
<tbody>
<tr>
<td>Olympic Gold Long Jump (inches)</td>
<td>282.9</td>
<td>299.3</td>
<td>317.3</td>
<td>319.8</td>
<td>336.3</td>
<td>342.5</td>
</tr>
</tbody>
</table>

A The winning distance in 2004 was probably between 345 and 360 inches.

B Most likely the winning jump was over 400 inches.

C The winning jump was exactly 348.7 inches.

D The data does not give enough information to predict.

19 The data show frequent flyer miles accumulated by seven travelers. Which number would the skew the average the most?

<table>
<thead>
<tr>
<th>Traveler</th>
<th>Moise</th>
<th>Brian</th>
<th>Tanya</th>
<th>Darryl</th>
<th>Sharon</th>
<th>Pierre</th>
<th>Bui</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequent Flyer Miles</td>
<td>10,470</td>
<td>8,642</td>
<td>11,007</td>
<td>14,712</td>
<td>8,642</td>
<td>106,571</td>
<td>9,861</td>
</tr>
</tbody>
</table>

A 106,571 miles

B 14,712 miles

C 9,861 miles

D 8,642 miles

20 The data show the age of female Oscar winners over a span of 70 years. Predict the age of the female Oscar winner in the year 2005.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>62</td>
<td>29</td>
<td>45</td>
<td>28</td>
<td>34</td>
<td>30</td>
<td>89</td>
<td>29</td>
</tr>
</tbody>
</table>

A 35

B 40 years or older

C impossible to predict

D less than 30 years old
21 Rolf has 700 CDs. Heidi’s collection is 80% the size of Rolf’s. Shawna’s collection is 50% the size of Heidi’s, and Terry’s is \(\frac{1}{7}\) the size of Shawna’s. How big is Terry’s CD collection?

A 280 CDs  
B 80 CDs  
C 50 CDs  
D 40 CDs

22 Mr. Quigley delivered more papers than Ms. Mertz, who delivered 542 papers, but fewer papers than Mr. Baum, who delivered 1,071 papers. Which inequality represents the number of papers, \(Q\), that Mr. Quigley delivered?

A \(Q > 542\)  
B \(542 < Q < 1,071\)  
C \(542 \leq Q \leq 1,071\)  
D \(Q < 1,071\)

23 Which graph is a function of \(x\)?

A Graph 1  
B Graph 2  
C Graph 3  
D Graph 4

24 When graphing data, one axis is normally used for the independent variable and the other for the dependent variable. What is the conventional usage?

A The \(x\)-axis is independent.  
B It makes no difference.  
C It depends on the data.  
D The \(y\)-axis is independent.

25 For the function \(f(2) = 16\), what represents the range?

A \(f\)  
B 2  
C 16  
D \(f(2)\)
Sample Test (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.

26 Which letter approximates the cube root of 29 on the number line?  

\[ \text{A} \quad A \]
\[ \text{B} \quad B \]
\[ \text{C} \quad C \]
\[ \text{D} \quad D \]

27 How would you describe the correlation between age to adulthood and language acquisition?  

\[ \text{A} \quad \text{negative correlation} \]
\[ \text{B} \quad \text{no correlation} \]
\[ \text{C} \quad \text{slightly negative correlation} \]
\[ \text{D} \quad \text{positive correlation} \]

28 Tripling Craig’s age and subtracting 18 will result in Jackson’s age. If Jackson is 15 years old, how old is Craig?  

\[ \text{A} \quad \text{3 years old} \]
\[ \text{B} \quad \text{10 years old} \]
\[ \text{C} \quad \text{11 years old} \]
\[ \text{D} \quad \text{15 years old} \]

29 If a triangle is subjected to a dilation, what remains constant in both the image and the preimage?  

\[ \text{A} \quad \text{The preimage and the image are congruent.} \]
\[ \text{B} \quad \text{The area of the two similar figures is always congruent.} \]
\[ \text{C} \quad \text{Angle congruence is always preserved.} \]
\[ \text{D} \quad \text{The image is always larger than the preimage.} \]

30 Renee, Becky, Sheila, and Alexis each attend different high schools. Each girl sold candy to raise money for their respective math teams. They sold 50%, 35%, 21%, and 100%, respectively, of each of their own team’s candy. Who sold the most candy?  

\[ \text{A} \quad \text{Alexis} \]
\[ \text{B} \quad \text{We do not have enough information to make that decision.} \]
\[ \text{C} \quad \text{Renee} \]
\[ \text{D} \quad \text{Sheila} \]
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.

31 A triangular garden has sides measuring 8 feet, 15 feet, and 17 feet. If the garden is increased in size to one similar in shape, but with the new shortest side equal to 18.4 feet, how long is the new longest side?
   A 25 feet  B 32 feet  C 34.5 feet  D 39.1 feet

32 What is the number 3 in the equation $-4y + 3x = 9$?
   A coefficient  B variable  C domain  D range

33 If the area of a circle is $9.0601\pi$ square inches, what is the radius of the circle?
   A 9.0601 inches  B 9.06 inches  C 3.01 inches  D 3 inches

34 To measure the height of a building, Geena moved away from the building until the angle on the clinometer she was using showed 45 degrees. At this time she was 200 feet away from the base of the building as shown in the figure. Approximately how tall is the building?

   A 50 feet  B 100 feet  C 200 feet  D 280 feet

35 Jessica was calculating the volume of a rectangular prism. She covered the bottom with 8 cubes that are 1 centimeter on each side. Then she stacked the cubes up and found it took 6 cubes to get to the top. What is the volume of the prism?
   A 48 cubic centimeters  B 24 cubic centimeters  C 14 cubic centimeters  D 8 cubic centimeters
Sample Test (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.

36 All of the numbers below except for one are perfect squares. Which answer contains the one which is not a perfect square?
A 169, 64, 9
B 900, 196, 49
C 400, 226, 4
D 100, 25, 441

37 Uncle Brian gives Rebecca money on each of her birthdays. How much money will Uncle Brian most likely give Rebecca on her 14th birthday?

<table>
<thead>
<tr>
<th>Birthday</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Money</td>
<td>$9</td>
<td>$12</td>
<td>$18</td>
<td>$30</td>
<td>$54</td>
</tr>
</tbody>
</table>
A $78
B $102
C $198
D $390

38 Syed’s age, A, is greater than Yolanda’s age, which is 13, but less than or equal to Paul’s age, which is 29. Which inequality represents Syed’s age?
A $13 < A < 29$
B $A < 13$ or $A > 29$
C $13 \leq A \leq 29$
D $13 < A \leq 29$

39 Tami is weighing her cat on a balance scale. All she has are rocks to use to find the weight of the cat. Each rock weighs 3 pounds. If the cat balances 4 of these rocks, how much does the cat weigh?
A 12 pounds
B 9 pounds
C 6 pounds
D $\frac{3}{4}$ pound

40 If Jamal goes from A to C by way of B in the figure shown, how many more miles is it than if he goes directly from A to C?

A 14 miles
B 12 miles
C 4 miles
D 2 miles
Sample Test (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.

41 The distance by road across a map of North Carolina is 12 inches. The map’s scale is $\frac{3}{4}$ inch equals 30 miles. If you drive that route at 50 miles per hour, how long will it take you to complete the trip?
   A 7 hours 12 minutes  
   B 9 hours 36 minutes  
   C 10 hours 15 minutes  
   D 14 hours 20 minutes

42 The volume of a sphere is given by the formula $V = \frac{4}{3}\pi r^3$. Solve the equation for the variable $r$.
   A $r = \sqrt[3]{\frac{3V}{4\pi}}$  
   B $\frac{3V}{4\pi} = r^3$  
   C $r = \frac{3\pi}{4}$  
   D $r^3 = \frac{3}{4}\pi$

43 Penny saves the same amount of money every month. The equation $T = 18M + 50$ shows how much money $T$ she has in her account at the end of every month $M$. What does the number 18 represent in the equation?
   A the money her uncle gave her to open the account  
   B the total amount of money she has in her account  
   C the money she saves each month  
   D the number of months Penny has been saving money at the bank

44 The average distance between the Sun and Earth is 1 astronomical unit, which equals about 93 million miles. If Mercury is about $\frac{1}{3}$ astronomical unit from the Sun, approximately how many miles is Mercury from the Sun?
   A 31 million miles  
   B 62 million miles  
   C 93 million miles  
   D 279 million miles

45 Tricia has a hexagonal hot tub on her porch. She wants to know how many cubic feet of water the hot tub holds when the water is 3 feet deep. Which model would represent the hot tub?
   A hexagonal prism  
   B hexagonal pyramid  
   C cylinder  
   D sphere
Sample Test (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.

46 The exact width of a room is 17.0102034 feet. How much less than 18 feet is this width?
   A 1 foot    B 0.9897966 feet
   C 0.9897965 feet    D 0.0102034 feet

47 Which point is an outlier?

A A  B B  C C  D D

48 Kyle is 63 years old and owns a dog named Pokie. If you cube Pokie’s age and subtract one, you get Kyle’s age. How old is Pokie?
   A 64 years old    B 32 years old
   C 8 years old    D 4 years old

49 A collection of North Carolina state quarters has a mass of 142 grams. If the mass of 1 quarter is about 5.67 grams, approximately how many quarters are in this collection?
   A 805 quarters    B 36 quarters
   C 28 quarters    D 25 quarters

50 What is the slant length of one side of the roof $x$ in the figure shown?

A 31 feet    B 25 feet
   C 20 feet    D 17 feet
Sample Test (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.

51 Juan’s dad designed a fort in the shape of a right rectangular prism. Juan asked that it be built larger, so his dad doubled the base’s length, and increased the base’s width by a factor of 1.7 and the height by a factor of 3. By what factor did this increase the volume of the fort?

A 6  
B 6.7  
C 10.2  
D 11.1

52 Which triangle does not illustrate Pythagorean triples?

Triangle 1  
Triangle 2  
Triangle 3  
Triangle 4

A Triangle 1  
B Triangle 2  
C Triangle 3  
D Triangle 4

53 What is the best way for Tyler to poll the students at his school to learn their favorite television show without talking to all 412 students?

A Check with a few students in the morning while they can still remember what they watched last evening.  
B Select a statistically random sample and poll that group.  
C Place everyone’s name in a hat and pull out five names. Poll these five individuals.  
D Speak to all 412 students; it is the only way to be accurate.

54 A model of the Great Pyramid is 9 inches on each side of the base. If the scale is 1 inch equals 84 feet, how long is each side of the real pyramid?

A 84 feet  
B 252 feet  
C 756 feet  
D 2,268 feet

55 What is the magnitude of the dilation that maps $XY$ onto $X'Y'$?

A $\frac{3}{4}$  
B $\frac{2}{3}$  
C $\frac{1}{2}$  
D $\frac{1}{3}$
Sample Test (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.

56 Mr. and Mrs. Marks’ home heating bill was $212 in November, $227 in December, and $257 and $317 in January and February. If the pattern continues, what will be the March bill?
   A $377   B $437
   C $677   D $777

57 The log shows the number of hits Lonnie got in his first four years playing baseball. If you consider his age and the number of hits, what correlation would you say existed?
   A age and hits are not correlated
   B positive
   C slightly negative
   D negative

58 Joe accepts an acting role suited to a much heavier person. To fit it, he goes on a weight-gaining diet. The graph represents his weight over a 12-week period. The ray intersects the vertical axis at the point (0, 155). What does the 155 represent?
   A Joe’s weight after the first week
   B the day Joe began the diet
   C Joe’s weight at the start of the diet
   D Joe’s target weight

59 If \( P \) has coordinates (2, 3), \( Q \) has coordinates \((-1, 5)\), and \( P' \), the image of \( P \) under a dilation, has coordinates (8, 12), what will the coordinates of \( Q' \) be under the same dilation?
   A \((4, 14)\)   B \(\left(-\frac{1}{4}, \frac{5}{4}\right)\)
   C \((-3, 15)\)   D \((-4, 20)\)

60 Which is an equation of the line with undefined slope containing the point (7, 9)?
   A \(x = 7\)
   B \(y = 7\)
   C \(y = 9\)
   D \(x = 9\)
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 Daniel claims that multiplying a number by 0.8 will always result in a product greater than multiplying the same number by 0.6. Testing his claim with which answer will prove him wrong?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>C</td>
<td>D</td>
</tr>
</tbody>
</table>

62 Ricardo would like to be a United States Senator, but the minimum age is 30 years old. When his age equals 4 added to twice his current age, he will be old enough. How old is Ricardo now?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>C</td>
<td>D</td>
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63 The data points represent Sim’s age and his weight at that age. Graph the data and choose the answer which best reflects Sim’s annual weight gain. (age, weight), (12, 87.5), (14, 112.5), (16, 137.5)

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64 Which is an equation of the line containing the points (2, 3) and (5, 9)?

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65 Based on the graph, what would you predict the value of the laptop computer will be after 4 years?

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Sample Test (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.

66 Spiros is flying a kite on the beach. His dog Bowser keeps chasing the kite so that he is always under it. Spiros lets out the string to triple its current length, and the kite goes straight up above Bowser. To the nearest ten feet, how high above Bowser is the kite now located?

A 1,000 feet  
B 880 feet  
C 870 feet  
D 660 feet

67 A go-cart travels at a rate of 14 feet per second. How far does it travel every 3 seconds?

A 14 feet  
B 42 feet  
C 64 feet  
D 168 feet

68 Xander is perched 30 feet up a tree, hunting deer. A deer stands 20 feet away from the base of his tree. What is the distance from his bow to the deer, to the nearest foot?

A 50 feet  
B 36 feet  
C 22 feet  
D 11 feet

69 Which is an equation of the line containing the points (−2, −8) and (10, −4)?

A \( y + 8 = \frac{1}{3}(x + 2) \)  
B \( y + 4 = 3(x − 10) \)  
C \( y + 8 = −\frac{3}{2}(x + 2) \)  
D \( y + 4 = −\frac{2}{3}(x − 10) \)

70 Which ordered pair is a solution of the inequality shown in the figure?

A (1, 4)  
B (4, 4)  
C (2, 3)  
D (0, 8)
A grocery store typically sells jars of peanut butter and jelly in a ratio of 15:7. If it sells 1,455 jars of peanut butter, about how many jars of jelly does it sell?

A. 950 jars of jelly
B. 730 jars of jelly
C. 680 jars of jelly
D. 210 jars of jelly

Coach Brown must rope off one side of the cross country course to keep spectators away from the finish line. He needs to tie rope between 23 posts which are each 75 feet apart. If he can purchase rope in lengths of 225 feet, how many lengths of rope will he need to purchase?

A. 6 lengths of rope
B. 8 lengths of rope
C. 12 lengths of rope
D. 13 lengths of rope

Tad has been successfully farming cotton for many years, both adding acres and increasing production per acre. What is the likely correlation between his cotton production and his acreage?

A. positive
B. slightly negative
C. there was no correlation
D. negative

Which is an equation of the line containing the points (11, 9) and (11, 5)?

A. \( x = 0 \)
B. \( y = 14 \)
C. \( x = 11 \)
D. \( y = 11 \)

The scale on a map is \( \frac{1}{2} \) inch equals 50 miles. If Asheville and Kernersville are 150 miles apart, how many inches apart are they on the map?

A. 1 inch
B. 1.5 inches
C. 2 inches
D. 3 inches
Sample Test (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.

76 A frying pan is circular with a radius of 24 inches. What effect would doubling the radius have on the area of the pan?
   A The area will increase by a factor of 2.
   B The area will increase by a factor of 48.
   C Doubling the radius would only affect the diameter, not the area.
   D The area will increase by a factor of 4.

77 A ladder to be used for painting can only be extended to a length of 25 feet. The base of the ladder must be 7 feet from the house. What is the highest point on the house that the ladder can reach?
   A 25 feet
   B 24 feet
   C 18 feet
   D 15 feet

78 The figure graphs \( R \), the number of days Eddie runs per month. Which inequality represents Eddie’s graph?

\[
7 \quad 7 \\
\text{Number of Days}\]
\[
\text{Eddie Runs Each Month}
\]

   A \( 7 < R < 15 \)
   B \( R > 7 \)
   C \( 7 \leq R < 15 \)
   D \( 7 < R \leq 15 \)

79 Which is an equation of the line containing the point \((10, -6)\) and having slope 0?
   A \( y = -6 \)
   B \( x = 10 \)
   C \( y = 0 \)
   D \( y = -3\frac{1}{4}x \)

80 Which is the equation of the line shown?

\[
\begin{align*}
A & \quad y = -3x + 2 \\
C & \quad y = 3x
\end{align*}
\]

STOP