



Pre-Algebra

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Michigan Grade Level Content Expectations for Mathematics, Grade 7, Correlated to Glencoe's *Pre-Algebra*

Lessons in which the grade level content expectation is the primary focus are indicated in **bold**.

NUMBER AND OPERATIONS			
Understand derived quantities			
Grade Level Content Expectation		Lesson(s)	Page Number(s)
N.MR.07.02	Solve problems involving derived quantities such as density, velocity, and weighted averages.	<i>Covered in Michigan Math Connects Course 2</i>	
Understand and solve problems involving rates, ratios, and proportions			
N.FL.07.03	Calculate rates of change including speed.	8-4, 8-5, 8-6a	412-424, 426
N.MR.07.04	Convert ratio quantities between different systems of units, such as feet per second to miles per hour.	6-3	275-280
N.FL.07.05	Solve proportion problems using such methods as unit rate, scaling, finding equivalent fractions, and solving the proportion equation $a/b = c/d$; know how to see patterns about proportional situations in tables.	6-2, 6-5, 6-6, Explore 6-7, 6-7, 6-8, 6-9, 7-3	270-274, 287-292, 294-317, 345-350
Recognize irrational numbers			
N.MR.07.06	Understand the concept of square root and cube root, and estimate using calculators.	Explore 10-1, 10-1, CSB-4	535-542, 862-863
Compute with rational numbers			

N.FL.07.07	Solve problems involving operations with integers.	2-1, Explore 2-2, 2-2, Explore 2-3, 2-3, Explore 2-4, 2-4, Explore 2-5, 2-5	61-66, 67-80, 82-95
N.FL.07.08	Add, subtract, multiply, and divide positive and negative rational numbers fluently.	3-3, 3-4, 3-5, 3-6	134-139, 141-158
N.FL.07.09	Estimate results of computations with rational numbers.	3-3, 3-5, 3-6	134-139, 147-158
ALGEBRA			
Understand and apply directly proportional relationships and relate to linear relationships			
A.PA.07.01	Recognize when information given in a table, graph, or formula suggests a directly proportional or linear relationship.	8-3, 8-4, 8-5,	406-424
A.RP.07.02	Represent directly proportional and linear relationships using verbal descriptions, tables, graphs, and formulas, and translate among these representations.	8-3, 8-4, 8-5,	406-424
A.PA.07.03	Given a directly proportional or other linear situation, graph and interpret the slope and intercept(s) in terms of the original situation; evaluate $y = mx + b$ for specific x values, e.g., weight vs. volume of water, base cost plus cost per unit.	8-5, 8-6, Explore 8-7, 8-7, Extend 8-7, 8-8	418-424, 427-432, 433-447
A.PA.07.04	For directly proportional or linear situations, solve applied problems using graphs and equations, e.g., the heights and volume of a container with uniform cross-section; height of water in a tank being filled at a constant rate; degrees Celsius and degrees Fahrenheit; distance and time under constant speed.	8-3, Explore 8-7, 8-7, 8-8, 8-9	406-411, 432-438, 441-452
A.PA.07.05	Recognize and use directly proportional relationships of the form $y = mx$, and distinguish from linear relationships of the form $y = mx + b$, b non-zero; understand that in a directly proportional relationship between two quantities one quantity is a constant multiple of the other quantity.	8-5	418-424
Understand and represent linear functions			
A.PA.07.06	Calculate the slope from the graph of a linear function as the ratio of "rise/run" for a pair of points on the graph, and express the answer as a fraction and a decimal; understand that linear functions have slope that is a constant rate of change.	8-5, 8-6, 8-7	418-424, 427-431, 433-438
A.PA.07.07	Represent linear functions in the	8-7, Extend 8-7	433-440

	form $y = x + b$, $y = mx$, and $y = mx + b$, and graph, interpreting slope and y-intercept.		
A.FO.07.08	Find and interpret the x and/or y intercepts of a linear equation or function. Know that the solution to a linear equation of the form $ax+b=0$ corresponds to the point at which the graph of $y=ax+b$ crosses the x axis.	8-7	433-438
Understand and solve problems about inversely proportional relationships			
A.PA.07.09	Recognize inversely proportional relationships in contextual situations; know that quantities are inversely proportional if their product is constant, e.g., the length and width of a rectangle with fixed area, and that an inversely proportional relationship is of the form $y = k/x$ where k is some non-zero number.	Extend 6-5	293
A.RP.07.10	Know that the graph of $y = k/x$ is not a line, know its shape, and know that it crosses neither the x nor the y-axis.	Extend 6-5, 9-7	293, 504-509
Apply basic properties of real numbers in algebraic contexts			
A.PA.07.11	Understand and use basic properties of real numbers: additive and multiplicative identities, additive and multiplicative inverses, commutativity, associativity, and the distributive property of multiplication over addition.	1-3, 4-1	18-23, 171-176
Combine algebraic expressions and solve equations			
A.FO.07.12	Add, subtract, and multiply simple algebraic expressions of the first degree, e.g., $(92x + 8y) - 5x + y$, or $x(x+2)$ and justify using properties of real numbers.	Explore 4-2, 4-2, 4-3, 4-4, 4-5	177-183, 184-189, 191-196, 199-204
A.FO.07.13	From applied situations, generate and solve linear equations of the form $ax + b = c$ and $ax + b = cx + d$, and interpret solutions.	4-5, 5-2, 5-5	178-183, 229-233, 248-253
GEOMETRY			
Draw and construct geometric objects			
G.SR.07.01	Use a ruler and other tools to draw squares, rectangles, triangles, and parallelograms with specified dimensions.	<i>Covered in Michigan Math Connects Course 2 and Course 3</i>	
G.SR.07.02	Use compass and straightedge to perform basic geometric constructions: the perpendicular bisector of a segment, an equilateral triangle, and the bisector of an angle; understand informal justifications.	CSB-8	870-872

Understand the concept of similar polygons, and solve related problems			
G.TR.07.03	Understand that in similar polygons, corresponding angles are congruent and the ratios of corresponding sides are equal; understand the concepts of similar figures and scale factor.	Explore 6-7, 6-7	300-306
G.TR.07.04	Solve problems about similar figures and scale drawings.	6-6, Explore 6-7, 6-7	294-306
G.TR.07.05	Show that two triangles are similar using the criteria: corresponding angles are congruent (AAA similarity); the ratios of two pairs of corresponding sides are equal and the included angles are congruent (SAS similarity); ratios of all pairs of corresponding sides are equal (SSS similarity); use these criteria to solve problems and to justify arguments.	6-7; Also covered in Michigan Math Connects Course 2 and Course 3	301-306
G.TR.07.06	Understand and use the fact that when two triangles are similar with scale factor of r , their areas are related by a factor of r^2 .	11-6	624-630
DATA AND PROBABILITY			
Represent and interpret data			
D.RE.07.01	Represent and interpret data using circle graphs, stem and leaf plots, histograms, and box-and-whisker plots, and select appropriate representation to address specific questions.	7-8, 13-2, 13-4, Extend 13-4, 13-5, Extend 13-5	376-381, 737-742, 750-763
D.AN.07.02	Create and interpret scatter plots and find line of best fit; use an estimated line of best fit to answer questions about the data.	Explore 1-6, 1-6, Extend 1-6, 8-9	39-48, 448-452
Compute statistics about data sets			
D.AN.07.03	Calculate and interpret relative frequencies and cumulative frequencies for given data sets.	<i>Covered in Michigan Math Connects Course 3</i>	
D.AN.07.04	Find and interpret the median, quartiles, and interquartile range of a given set of data.	13-3	742-749

LA = Looking Ahead to Next Year; CSB = Concepts and Skills Bank; P = Projects; CC = Cross Curricular