

END OF INSTRUCTION -- ALGEBRA 1

CONTENT STANDARDS AND OBJECTIVES

Standard 1: Number Sense and Algebraic Operations—The student will use expressions and equations to model number relationships.

1. Translate word phrases and sentences into expressions and equations and vice versa.
2. Expressions*
 - b. Simplify and evaluate linear, absolute value, rational, and radical expressions.
 - c. Simplify polynomials by adding, subtracting, or multiplying.

Standard 2: Relations and Functions—The student will use relations and functions to model number relationships.

1. Relations and Functions
 - a. Distinguish between linear and nonlinear data.
 - b. Distinguish between relations and functions.
 - c. Identify dependent and independent variables, domain and range.
 - d. Evaluate a function using tables, equations, or graphs.
 2. Recognize the parent graph of the functions $y = k$, $y = x$, $y = |x|$, and predict the effects of transformations on the parent graph (e.g., $y = |x| + 2$, change slope, change intercepts, change slope and intercept).
 3. Calculate the slope of a line using a graph, an equation, two points, or a set of data points.
 4. Develop the equation of a line and graph linear relationships given the following:
 - a. slope and y-intercept
 - b. slope and one point on the line
 - c. two points on the line
 - d. x-intercept and y-intercept
 - e. a set of data points
- * The skill 1.2.a was removed from PASS.
5. Slope Interpretation
 - a. Use the slope to differentiate between lines that are parallel, perpendicular, horizontal, or vertical.
 - b. Interpret the slope and intercepts within the context of everyday life (e.g., telephone charges based on base rate [y-intercept] plus rate per minute [slope]).
 6. Linear Equations and Inequalities
 - a. Solve linear equations by graphing or using properties of equality.
 - b. Solve linear inequalities by graphing or using properties of inequalities.
 - c. Match appropriate equations or inequalities (with 1 or 2 variables) to a graph, table, or situation and vice versa.
 7. Solve a system of linear equations by graphing, substitution, or elimination.
 8. Problem Solving
 - a. Use the formulas from measurable attributes of geometric models (perimeter, circumference, area, and volume), science, and statistics to solve problems within an

algebraic context.

b. Solve two-step and three-step problems using concepts such as rules of exponents, probability, rate, distance, ratio and proportion, measures of central tendency, and percent.

9. Nonlinear Functions

a. Match exponential and quadratic functions to a table, graph, or situation and vice versa.

b. Solve quadratic equations by graphing, factoring, or using the quadratic formula.

Standard 3: Data Analysis and Statistics—The student will use data analysis and statistics to formulate and justify predictions from a set of data.

1. Data Analysis

a. Translate from one representation of data to another and understand that the data can be represented using a variety of tables, graphs, or symbols and that different modes of representation often convey different messages.

b. Make valid inferences, predictions, and/or arguments based on data from graphs, tables, and charts.

2. Collect data involving two variables and display on a scatter plot; interpret results using a linear model/equation and identify whether the model/equation is a line of best fit for the data (e.g., given a scatter plot and several linear equations, which one is the best fit?).

PROCESS STANDARDS AND OBJECTIVES ALGEBRA I

Standard 1: Problem Solving

1. Apply a wide variety of problem-solving strategies (identify a pattern, use equivalent representations) to solve problems from within and outside mathematics.

2. Identify the problem from a described situation, determine the necessary data and apply appropriate problem-solving strategies.

Standard 2: Communication

1. Use mathematical language and symbols to read and write mathematics and to converse with others.

2. Demonstrate mathematical ideas orally and in writing.

3. Analyze mathematical definitions and discover generalizations through investigations.

Standard 3: Reasoning

1. Use various types of logical reasoning in mathematical contexts and real-world situations.

2. Prepare and evaluate suppositions and arguments.

3. Verify conclusions, identify counter-examples, test conjectures, and justify solutions to mathematical problems.

4. Justify mathematical statements through proofs.

Standard 4: Connections

1. Link mathematical ideas to the real world (e.g., statistics helps qualify the confidence we can have when drawing conclusions based on a sample).
2. Apply mathematical problem-solving skills to other disciplines.
3. Use mathematics to solve problems encountered in daily life.
4. Relate one area of mathematics to another and to the integrated whole (e.g., connect equivalent representations to corresponding problem situations or mathematical concepts).

Standard 5: Representation

1. Use algebraic, graphic, and numeric representations to model and interpret mathematical and real-world situations.
2. Use a variety of mathematical representations as tools for organizing, recording, and communicating mathematical ideas (e.g., mathematical models, tables, graphs, spreadsheets).
3. Develop a variety of mathematical representations that can be used flexibly and appropriately.