Eureka Math Parent Guide

A GUIDE TO SUPPORT PARENTS AS THEY WORK WITH THEIR STUDENTS IN MATH.

GRADE FOCUS

Eighth grade mathematics is about (1) formulating and reasoning about expressions and equations, with a special focus on linear equations and systems of linear equations; (2) grasping the concept of a function and using functions to describe quantitative relationships; (3) analyzing two- and three-dimensional space and figures using distance, angle, similarity, and congruence, and understanding and applying the Pythagorean Theorem.

- Module 1: Integer Exponents and Scientific Notation
- Module 2: The Concept of Congruence
- Module 3: Similarity
- » **Module 4: Linear Equations**
- Module 5: Examples of Functions from Geometry
- Module 6: Linear Functions
- Module 7: Introduction to Irrational Numbers Using Geometry

LET'S CHECK IT OUT!

MODULE 4 FOCUS

In this 31-lesson module, students extend what they already know about unit rates and proportional relationships to linear equations and their graphs. They understand the connections between proportional relationships, lines, and linear equations. They will also transcribe and solve equations in one variable and then in two variables.

MORE SPECIFICALLY, CHILDREN WILL LEARN HOW TO:

- Understand the connections between proportional relationships, lines, and linear equations.

- Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.

- Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.

- Solve linear equations in one variable.

- Analyze and solve pairs of simultaneous linear equations.

TOPIC OVERVIEW

Topics are the lessons within a module that help children master the skills above. Here are the lessons that will guide your child through Module 4:

- Topic A: Writing and Solving Linear Equations

- Topic B: Linear Equations in Two Variables and Their Graphs

- Topic C: Slope and Equations of Lines

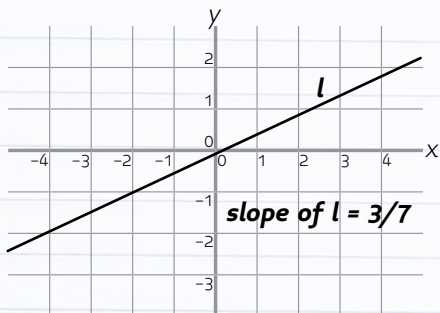- Topic D: Systems of Linear Equations and Their Solutions

WORDS TO KNOW

- **Slope**: A number that describes the "steepness" or "slant" of a line. It is the constant rate of change. Slope is represented by the variable m in the equation of a line ($y = mx + b$).

- **System of Linear Equations:** A system of linear equations, also referred to as simultaneous linear equations, is a set of at least two linear equations.

- **Solution to a system of linear equations:** A solution to a system of linear equations is the point at which the two lines intersect (parallel lines never intersect and therefore have no solution). The coordinates of the point of intersection can be plugged into both equations to make a true number sentence.

SAMPLE PROBLEMS

SAMPLE 1

Ask your child to explain why the slope of the line below is 3/7. Their explanation should include a reference to two points on the line with integer coordinates, (–2, –1) and (5, 2) as well as slope being the number that compares the vertical distance between the two points to the horizontal distance between the two points.

slope of l = 3/7

SAMPLE 2

Linear: Yes or No?

Write each of the following statements as a mathematical expression. State whether the expression is linear and explain your answer.

1. The sum of a number and four times the number.

Solution: Let x be a number, then, $x + 4x$ is a linear expression because x is raised to the power of 1.

2. Half of the product of a number multiplied by itself, three times.

Solution: Let x be a number, then, $(x*x*x)/2$ is x^3 which is not a linear expression because x is raised to the power of 3.

SAMPLE 3

Solving Linear Equations

For the problem below, show your work and check that your solution is correct.

Solve the linear equation: $x + 4 + 3x = 72$. State the property that justifies your first step and why you chose it.

Solution:
I used the commutative and distributive properties on the left side of the equal sign to simplify the expression to fewer terms.

$$x + 4 + 3x = 72$$
$$4x + 4 = 72$$
$$4x + 4 - 4 = 72 - 4$$
$$4x = 68$$
$$\frac{4x}{4} = \frac{68}{4}$$
$$x = 17$$

The left side is equal to $17 + 4 + 3(17) = 21 + 51 = 72$, which is what the right side is. therefore, $x = 17$ is a solution to the equation $x + 4 + 3x = 72$.

HOW YOU CAN HELP AT HOME

- Every day, ask your child what they learned in school and ask them to show you an example.
- Ask your child to explain the difference between linear and non-linear expressions.