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 5 FOCUS

In module 5, students learn the concept of a function and why functions are necessary for describing geometric concepts and occurrences in everyday life. Students also learn about the important rule functions play in making predictions. Students will inspect the rate of change of linear functions and conclude that the rate of change is the slope of the graph of a line. They will learn to interpret the equation y = mx + b as defining a linear function whose graph is a line. Students will also gain some experience with non-linear functions, specifically by compiling and graphing a set of ordered pairs, and then by identifying the graph as something other than a straight line.

MORE SPECIFICALLY, CHILDREN WILL LEARN HOW TO:

- Define, evaluate, and compare functions.
  - » Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.
  - » Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
  - » Interpret the equation = m + b as defining a linear function whose graph is a straight line; give examples of functions that are not linear.
- Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.
  - » Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

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 5:

- Topic A: Functions
- Topic B: Volume

WORDS TO KNOW

- **Function**: A function is a rule that assigns to each input exactly one output. Functions can be represented in various ways. Some ways functions are seen in this module are graph, table, rule, and verbal description.
- **Input**: The number or piece of data that is put into a function is the input.
- **Output**: The number or piece of data that is the result of an input of a function is the output.
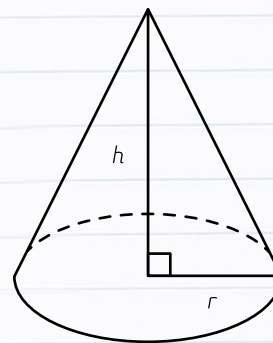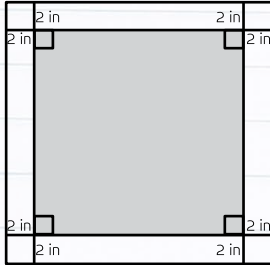

Cone
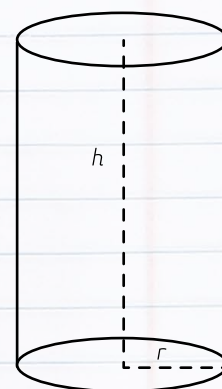
Cylinder
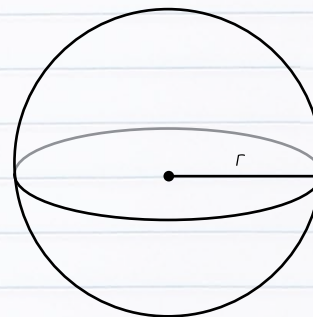
Sphere

SAMPLE PROBLEMS

SAMPLE 1

Write a function that would allow you to calculate the area, A, of a 2-inch white border for any sized square figure with sides of length s measured in inches.

Solution:

Let's represent the side length of the inner square. Then the area of the inner square is s^2. The side length of the larger square is $s + 4$ and the area is $(s + 4)^2$. If A is the area of the 2-inch border, then the function that describes A is $A = (s + 4)^2 - s^2$

SAMPLE 2: UNDERSTANDING FUNCTIONS

1. Can the table shown to the right represent a function? Explain.

Solution: No, the table cannot represent a function because the input of 5 has two different outputs. Functions assign only one output to each input.

Input (x)	1	3	5	5	9
Output (y)	7	16	19	20	28

2. Can the table shown to the right represent a function? Explain.
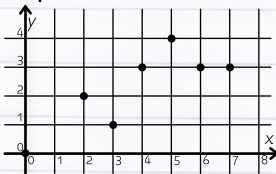
Solution: Yes, the table can represent a function. Even though there are two outputs that are the same, each input has only one output.

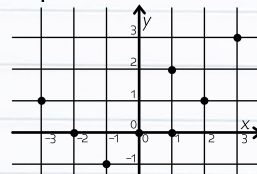| Input (x)	10	20	50	75	90
Output (y)	32	32	156	240	288

SAMPLE 3

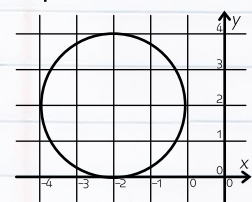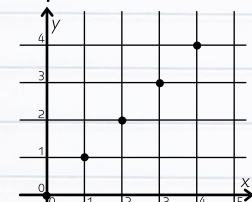Which of the four graphs below are functions? Explain.

Graph 1

Graph 2

Graph 3

Graph 4

Solution:

Graphs 1 and 4 are functions. Graphs 2 and 3 are not. Graphs 1 and 4 show that for each input of x, there is a unique output of y. For Graph 2, the input of x=1 has two different outputs, y=0 and y=2, which means it cannot be a function. For Graph 3, it appears that each value of x has two outputs, one on the lower half of the circle and one on the upper half, which means it does not fit the definition of function.

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 how to identify a linear relationship.
- Ask your child to calculate the volume of the cone below. What formula did they use? How did they use the formula to determine the volume?