EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

Topic C extends students' work with constant rate as it applies to the **slope** of a line. Students determine the slope by using any two points from the graph of a line. Students then apply the slope of the line to the **slope-intercept form** to find the equation of that line. For example, if the slope is 3, the slope-intercept form of the line could be $y = 3x + 8$. Last, students compare various proportional relationships represented in graphs, tables, equations, and descriptions.

You can expect to see homework that asks your child to do the following:

- Determine whether the slope of a line is positive or negative, and then find the exact value of the slope or **y-intercept point**. The data used may be given in graphs, tables, equations, or descriptions.

- Confirm that the slope of a line stays the same when using two different points on the line to determine the slope.

- Using the properties of equality, transform an equation from **standard form** to slope-intercept form and vice versa.

- Given points on a line—or the graph, table, equation, or description of the line—determine one or more of the other representations (i.e., points, graph, table, equation, or description) of the line.

- Determine whether two equations result in the same line when graphed.

- Find and graph various solutions to an equation.

SAMPLE PROBLEMS *(From Lesson 22)*

A faucet leaks at a constant rate of 7 gallons per hour. Suppose y gallons leak in x hours. Express the situation as a linear equation in two variables.

$$\frac{y}{x} = 7 \quad \text{or} \quad y = 7x$$

Another faucet leaks at a constant rate, and the table below shows the number of gallons, y, that leak in x hours.

Number of Hours (x)	Number of Gallons (y)
2	13
4	26
7	45.5
10	65

Determine the rate at which the second faucet leaks.

Let m represent the rate at which this faucet leaks in gallons per hour.

$$m = \frac{(26 - 13)}{(4 - 2)}$$

$$m = \frac{13}{2}$$

$$m = 6.5$$

The second faucet leaks at a rate of 6.5 gallons per hour.

Which faucet has the worse leak? That is, which faucet leaks more water over a given time interval?

The first faucet has the worse leak because the rate is greater: 7 gallons per hour compared to 6.5 gallons per hour.

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

For more resources, visit » *Eureka.support*

HOW YOU CAN HELP AT HOME

You can help at home in many ways. Here are some tips to help you get started.

- Give your child proportional relationships in different forms (e.g., an equation such as $y = \frac{5}{2}x - 6$ and a description such as "Mary types at a rate of $3\frac{1}{3}$ words per minute."). Challenge him to determine which situation has the greater rate. (Mary has a greater rate.) Equations and constant rate descriptions like these can be found in many of the lessons in this topic.

- Use class examples to find the slope of a situation presented in different forms. Give your child two points, a table of points, a graph, an equation, or a description of a situation, and ask her to find the slope of the line that represents the situation.

- Write a two-variable equation, and ask your child to transform the equation such that it says "$y =$" or "$p =$" or that one of the variables equals the rest. You can find these examples in the lessons, or you can make up equations yourself. For example, $2x + 3y = -6$ would transform to $y = -\frac{2}{3}x - 2$ when rewriting the equation in slope-intercept form, or "$y =$".

TERMS

Intercept point: The point $(0, b)$ at which a line intersects the y-axis where b is the y-value of the y-intercept point. There is also an x-intercept point, $(x, 0)$, where the line intersects the x-axis.

Slope: A number that describes the steepness or slant of a line. The unit rate (e.g., number of miles per hour) or rate of change (how one quantity changes in relation to another) is often interpreted as the slope of a graph. Lines that go up from left to right have a positive slope, and lines that go down from left to right have a negative slope. The slope, m, of a line can be found using the following equation:

$$m = \frac{\text{difference in } y\text{-values}}{\text{difference in } x\text{-values}} = \frac{p_2 - r_2}{p_1 - r_1} = \frac{y_2 - y_1}{x_2 - x_1}.$$

Slope-intercept form of a linear equation: A linear equation written as $y = mx + b$, where m represents the slope of the line and b represents the y-value of the y-intercept point.

Standard form of a linear equation: The standard form of a linear equation is written as $ax + by = c$ (e.g., $2x + 3y = 17$).