EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

In Topic B, students write linear equations to represent **constant rate** problems. The lessons in this topic introduce students to the standard form of an equation in two variables and ask students to write, interpret, and graph information from various situations.

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

- Write and solve problems with **proportional relationships** involving speed, distance, time, and other constant rates.
- Write a **linear equation in two variables**.
- Given the value of one variable, solve a two-variable linear equation to determine the value of the other variable.
- Compute information for a constant rate problem, or a linear equation, and graph the data in the **coordinate plane**.
- Given data in a coordinate plane, determine whether the data represent a given linear equation.
- Find solutions to an equation, and plot the solutions as points on a coordinate plane.
- Graph linear equations on the coordinate plane.

SAMPLE PROBLEM *(From Lesson 11)*

Juan types at a constant rate. He can type a full page of text in $3\frac{1}{2}$ minutes. How many pages, p, can Juan type in t minutes?

a. Write a linear equation representing the number of pages Juan can type in any given time period.

Let C represent the constant rate that Juan types in pages per minute. Then, $\frac{1}{3.5} = C$ and $\frac{p}{t} = C$; therefore, $\frac{1}{3.5} = \frac{p}{t}$.

$$\frac{1}{3.5} = \frac{p}{t}$$

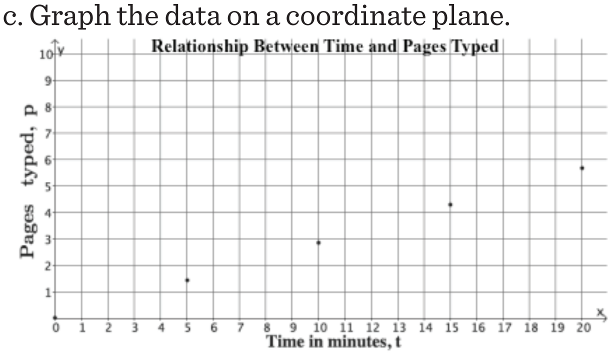
$$(t)\frac{1}{3.5} = \frac{p}{t}(t)$$

$$\frac{1}{3.5}t = p$$

b. Complete the table below. Use a calculator, and round your answers to the tenths place.

t (time in minutes)	Linear Equation: $p = \frac{1}{3.5}t$	p (pages typed)
0	$p = \frac{1}{3.5}(0)$	0
5	$p = \frac{1}{3.5}(5)$	$\frac{5}{3.5} \approx 1.4$
10	$p = \frac{1}{3.5}(10)$	$\frac{10}{3.5} \approx 2.9$
15	$p = \frac{1}{3.5}(15)$	$\frac{15}{3.5} \approx 4.3$
20	$p = \frac{1}{3.5}(20)$	$\frac{20}{3.5} \approx 5.7$

c. Graph the data on a coordinate plane.



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

HOW YOU CAN HELP AT HOME

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

- Point out activities involving rate in everyday life (i.e., things you do that can be measured in terms of the time it takes to do them, such as number of words typed per minute or number of hot dogs sold per hour). Have a conversation about whether those rates are actually constant or whether we simply speak of the average rate as if it were constant. For example, do you actually drive through town at a constant rate of 30 mph, or is that your average rate? We will use constant rate often in this topic to mean average rate.
- Give your child a rate, and have her determine an equivalent rate. For example, if you walk at an average rate of 3 miles per hour, how many hours will it take you to walk 9 miles? Since $\frac{3 \text{ miles}}{1 \text{ hour}} = \frac{9 \text{ miles}}{x \text{ hours}} = \frac{9 \text{ miles}}{3 \text{ hours}}$, it will take you 3 hours. How many miles can you walk in $1\frac{1}{2}$ hours? Since $\frac{3 \text{ miles}}{1 \text{ hour}} = \frac{x \text{ miles}}{1.5 \text{ hours}} = \frac{4.5 \text{ miles}}{1.5 \text{ hours}}$, you can walk 4.5 miles in $1\frac{1}{2}$ hours.
- Write a two-variable equation for the situations described above, making sure to define the variables. For the example above, if m represents the number of miles walked and t represents the number of hours you walk, the two-variable equation is $m = \frac{3}{1}t$, or just $m = 3t$.

TERMS

Constant rate: The rate at which something can be done that is the same over any time interval. For example, a typist might type at a constant rate of 200 words per minute, and a racing cyclist might ride at a constant speed of 25 miles per hour.

Coordinates: The location of a point on the coordinate plane, written as (x, y). The first number is always the x-value of the point (left/right), and the second number is always the y-value of the point (up/down).

Linear equation in two variables: An equation with two variables (e.g., $y = 2x + 4$). The variables have exponents of 1 or 0 only and cannot be the denominator in a fraction when the equation is in standard form. All linear equations can be graphed as straight lines in the coordinate plane. Other examples include $x = 3$ (implies $0y + 1x = 3$) and $\frac{1}{4}c - 8v = 9$.

Proportional relationship: When two quantities (e.g., the weight of an item and its price) increase or decrease at the same rate, their relationship is proportional. If 1 pound of tomatoes sells for \$4 (1:4) and 2 pounds sell for \$8 (2:8), the weight and price are proportional. That is, each measure in the second quantity (4 and 8), when divided by its corresponding measure in the first quantity (1 and 2), produces the same number (4), called a constant.

MODELS

Coordinate Plane