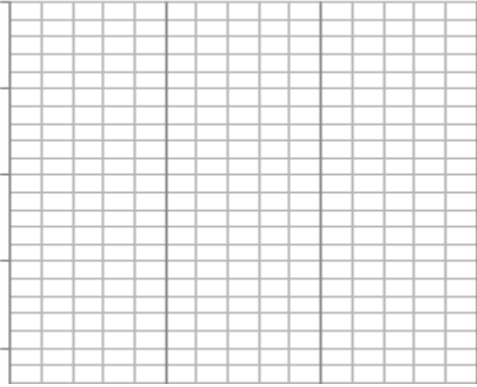# Lesson 10: Interpreting Graphs of Proportional Relationships

Classwork

Example 1

Grandma's Special Chocolate Chip Cookie recipe, which yields 4 dozen cookies, calls for 3 cups of flour.

Using this information, complete the chart:

Table – Create a chart comparing the amount of flour used to the amount of cookies.	**Table** – Is the number of cookies proportional to the amount of flour used? Explain	**Unit Rate** – What is the unit rate and what is the meaning in the context of the problem?
Graph – Model the relationship on a graph.	Does the **graph** show the two quantities being **proportional** to each other? Explain	**Equation** – Write an equation that can be used to represent the relationship.

Lesson 10:
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Interpreting Graphs or Proportional Relationships
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Example 2

Below is a graph modeling the amount of sugar required to make Grandma's Chocolate Chip Cookies.
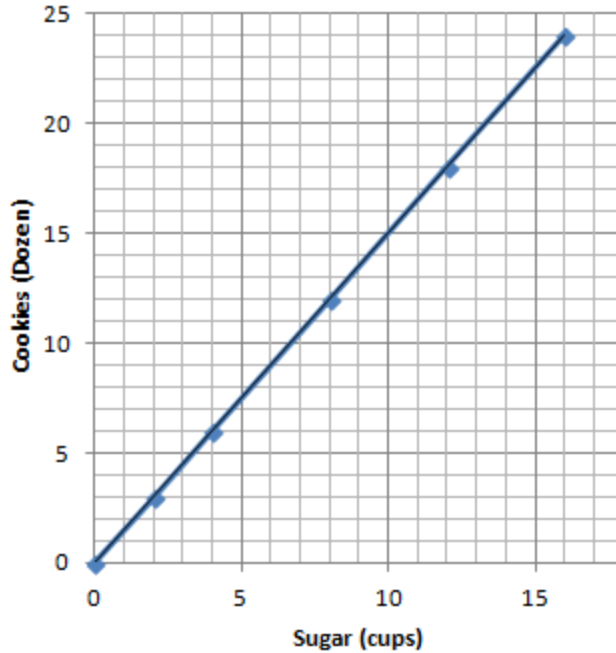
a. Record the coordinates of flour of the points from the graph in a table. What do these ordered pairs (values) represent?

b. Grandma has 1 remaining cup of sugar. How many dozen cookies will she be able to make? Plot the point on the graph above.

c. How many dozen cookies can grandma make if she has no sugar? Can you graph this on the grid provided above? What do we call this point?

Exercises

1. The graph below shows the amount of time a person can shower with a certain amount of water.
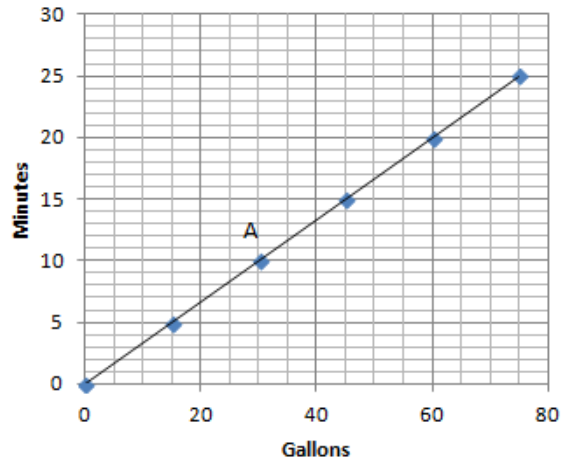
    a. Can you determine by looking at the graph whether the length of the shower is proportional to the number of gallons of water?   Explain how you know.

    b. How long can a person shower with 15 gallons of water and with 60 gallons of water?

    c. What are the coordinates of point A? Describe point A in the context of the problem.

    d. Can you use the graph to identify the unit rate?

    e. Plot the unit rate on the graph. Is the point on the line of this relationship?

    f. Write the equation to represent the relationship between the number of gallons used and the length of a shower.

2. Your friend uses the equation $C = 50P$ to find the total cost of P people entering the local Amusement Park.

    a. Create a table and record the cost of entering the amusement park for several different-sized groups of people.

    b. Is the cost of admission proportional to the amount of people entering the Amusement Park? Explain why or why not.

    c. What is the unit rate and what does it represent in the context of the situation?

    d. Sketch a graph to represent this relationship.
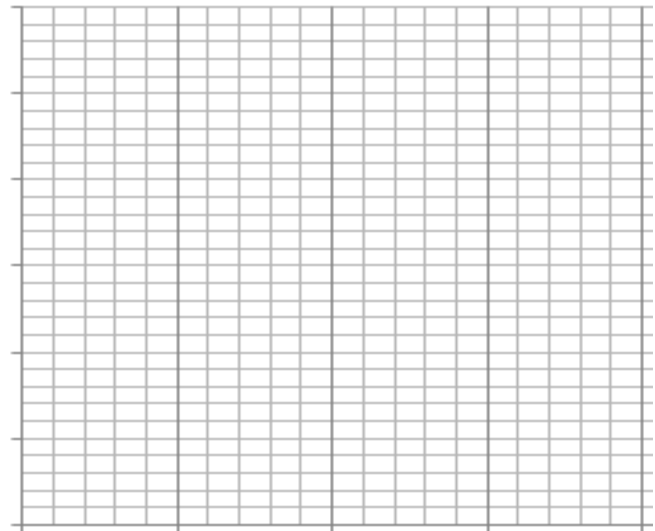
e.   What point(s) MUST be on the graph of the line if the two quantities represented are proportional to each other? Explain why and describe this point in the context of the problem.

f.   Would the point (5,250) be on the graph? What does this point represent in the context of the situation?

Problem Set

1. The graph to the right shows the distance (in ft.) ran by a Jaguar.

   a. What does the point (5, 280) represent in the context of the situation?

   b. What does the point (3, 174) represent in the context of the situation?

   c. Is the distance run by the Jaguar proportional to the time? Explain why or why not.

   d. Write an equation to represent the distance ran by the Jaguar. Explain or model your reasoning.

2. Championship T-shirts sell for $22 each.

   a. What point(s) MUST be on the graph for the quantities to be proportional to each other?

   b. What does the ordered pair (5, 110) represent in the context of this problem?

   c. How many T-shirts were sold if you spent a total of $88?
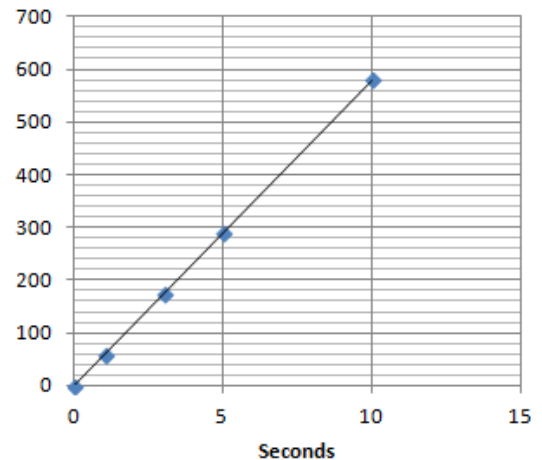
3. The following graph represents the total cost of renting a car. The cost of renting a car is a fixed amount each day regardless of how many miles the car is driven. It does not matter how many miles you drive; you just pay an amount per day.

   a. What does the ordered pair (4, 250) represent?

   b. What would be the cost to rent the car for a week? Explain or model your reasoning.
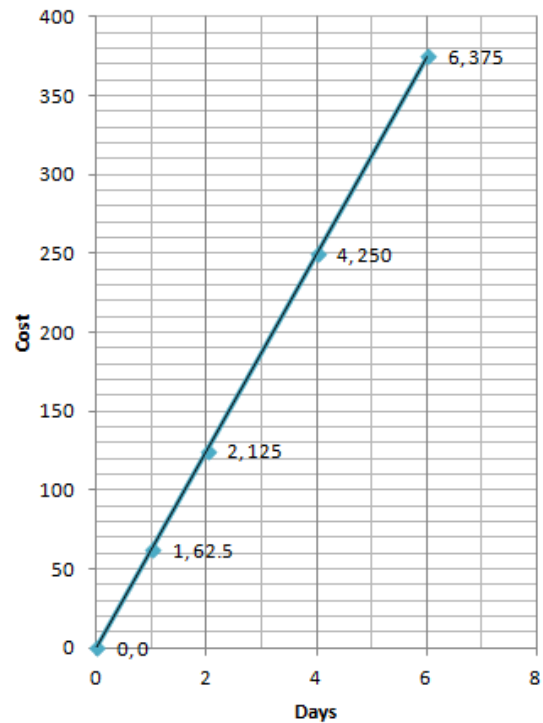
4. Jackie is making a snack mix for a party. She is using M&M's and peanuts. The table below shows how many packages of M&M's she needs to how many cans of peanuts she needs to make the mix.

   a. What points MUST be on the graph for the number of cans of peanuts to be proportional to the packages of M&M's? Explain why.

   b. Write an equation to represent this relationship.

   c. Describe the ordered pair (12, 24) in the context of the problem.

Packages of M&M's	Cans of Peanuts
0	0
1	2
2	4
3	6
4	8

5.   The following table shows the amount of candy and price paid.

Amount of Candy (pounds)	2	3	5
Cost (Dollars)	5	7.5	12.5

a.   Is the cost of candy proportional to the amount of candy?

b.   Write an equation to illustrate the relationship between the amount of candy and the cost.

c.   Using the equation, predict how much it will cost for 12 pounds of candy?

d.   What is the maximum amount of candy you can buy with $60?

e.   Graph the relationship.