Homework 5.1

1) Suzette and Margo want to prepare crêpes for all of the students in their French class. A recipe makes 20 crêpes with a certain amount of flour, milk, and 2 eggs. The girls already know that they have plenty of flour and milk to make 50 crêpes, but they need to determine the number of eggs they will need for the recipe because they are not sure they have enough.

a. Considering the amount of eggs necessary to make the crêpes, what is the constant of proportionality?

b. What does the constant or proportionality mean in the context of this problem?

c. How many eggs are needed to make 50 crêpes?

2. Bananas are $0.59/pound.

a. What is the constant of proportionality, or $k$?

b. How much will 25 pounds of bananas cost?

3. The dry cleaning fee for 3 pairs of pants is $18.

a. What is the constant of proportionality?

b. How much will the dry cleaner charge for 11 pairs of pants?

4. For every $5 that Micah saves, his parents give him $10.

a. What is the constant of proportionality?

b. If Micah saves $150, how much money will his parents give him?
Homework 5.2

1. Each school year, the seventh graders who study Life Science participate in a special field trip to the city zoo. In 2010, the school paid $1,260 for 84 students to enter the zoo. In 2011, the school paid $1,050 for 70 students to enter the zoo. In 2012, the school paid $1,395 for 93 students to enter the zoo.
   a. Is the price the school pays each year in entrance fees proportional to the number of students entering the zoo?
   b. Explain why or why not.
   c. Identify the constant of proportionality, and explain what it means in the context of this situation.
   d. What would the school pay if 120 students entered the zoo?
   e. How many students would enter the zoo if the school paid $1,425?
5.3 Homework

John and Amber work at an ice cream shop. The hours worked and wages earned are given for each person.

<table>
<thead>
<tr>
<th>John’s Wages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (in hours)</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
</tbody>
</table>

1. Determine if John’s wages are proportional to time. If they are, determine the unit rate of \( \frac{y}{x} \). If not, explain why they are not.

2. Determine if Amber’s wages are proportional to time. If they are, determine the unit rate of \( \frac{y}{x} \). If not, explain why they are not.

3. Write an equation for both John and Amber that models the relationship between their wage and the time they worked. Identify the constant of proportionality for each. Explain what it means in the context of the situation.

4. How much would each worker make after working 10 hours? Who will earn more money?

5. How long will it take each worker to earn $50?
5.4 Homework

Write an equation that will model the proportional relationship given in each real-world situation.

1. There are 3 cans that store 9 tennis balls. Consider the number of balls per can.
   a. Find the constant of proportionality for this situation.
   b. Write an equation to represent the relationship.

2. In 25 minutes Li can run 10 laps around the track. Determine the number of laps she can run per minute.
   a. Find the constant of proportionality in this situation.
   b. Write an equation to represent the relationship.

3. Jennifer is shopping with her mother. They pay $2 per pound for tomatoes at the vegetable stand.
   a. Find the constant of proportionality in this situation.
   b. Write an equation to represent the relationship.
5.5 Homework

1. On average, Susan downloads 60 songs per month. An online music vendor sells package prices for songs that can be downloaded onto personal digital devices. The graph below shows the package prices for the most popular promotions. Susan wants to know if she should buy her music from this company or pay a flat fee of $58.00 per month offered by another company. Which is the better buy?

   a. Find the constant of proportionality for this situation.

   b. Write an equation to represent the relationship.

   c. Use your equation to find the answer to Susan’s question above. Justify your answer with mathematical evidence and a written explanation.
5.6 Homework
1. Suppose that the cost of renting a snowmobile is $37.50 for 5 hours.
   
a) If c represents the cost, and h represents the hours, which variable is the dependent variable?
   
b) Write an equation to determine cost.
   
c) What would be the cost of renting a snowmobile for 8 hours?
2. In Katya’s car, the number of miles driven is proportional to the number of gallons of gas used. Find the missing value in the table.

<table>
<thead>
<tr>
<th>Number of Gallons</th>
<th>Number of Miles Driven</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>112</td>
</tr>
<tr>
<td>6</td>
<td>168</td>
</tr>
<tr>
<td>10</td>
<td>224</td>
</tr>
<tr>
<td>10</td>
<td>280</td>
</tr>
</tbody>
</table>

a. Write an equation that will relate the number of miles driven to the number of gallons of gas.

b. What is the constant of proportionality?

c. How many miles could Katya go if she filled her 22-gallon tank?

d. If Katya takes a trip of 600 miles, how many gallons of gas would be needed to make the trip?

e. If Katya drives 224 miles during one week of commuting to school and work, how many gallons of gas would she use?
5.7 Homework

1. The graph to the right shows the relationship of the amount of time (in seconds) to the distance (in feet) run by a jaguar.
   a. What does the point (5, 290) 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 run by the jaguar. Explain or model your reasoning.

2. The 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.
   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.
5.8 Homework

1. Jackie is making a snack mix for a party. She is using cashews and peanuts. The table below shows the relationship of the number of packages of cashews she needs to the number of cans of peanuts she needs to make the mix.

<table>
<thead>
<tr>
<th>Packages of Cashews</th>
<th>Cans of Peanuts</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
</tr>
</tbody>
</table>

a. Write an equation to represent this relationship.

b. Describe the ordered pair (12, 24) in the context of the problem.
5.8 Homework

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

<table>
<thead>
<tr>
<th>Amount of Candy (in pounds)</th>
<th>2</th>
<th>3</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost (in dollars)</td>
<td>5</td>
<td>7.5</td>
<td>12.5</td>
</tr>
</tbody>
</table>

a. Is the cost of the 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.
5.9 Homework

Solve the problems using cross multiplication

1. \( \frac{3}{4} = \frac{4}{x} \)

2. \( \frac{5}{m} = \frac{2}{3} \)

3. In January, Mr. Jordan ordered five pizzas for 18 people. In February he will have a celebration with 45 people. How many pizzas should he order?

4. Mr. Jordan and Ms. Ritter were trying to solve a proportion problem.
   
   A dog can walked 5 miles in 2 hours. At this rate, how many hours will it take to walk 13 miles?

   They both set up a proportion, but they don’t look the same. Will Mr. Jordan and Ms. Ritter get the same answer? Explain.

   Jordan
   
   \( \frac{5 \text{ mi}}{2 \text{ hr}} = \frac{13 \text{ mi}}{x \text{ hr}} \)

   Ritter
   
   \( \frac{2 \text{ hr}}{5 \text{ mi}} = \frac{x \text{ hr}}{13 \text{ mi}} \)
5.10 Homework

Solve the problems using cross multiplication

1. \( \frac{3}{8} = \frac{5}{y} \)
2. \( \frac{5}{n} = \frac{4}{3} \)

3. Mr. Jordan went to a doughnut shop and paid $3 for five doughnuts
   
   a) At this price, how much would eight doughnuts cost?

   b) How much do 12 doughnuts cost?

   c) How many doughnuts can you get for $7?

4. Gabriela walked \( 1 \frac{3}{4} \) miles in \( \frac{1}{2} \) hour.

   a) At this rate, how many miles would she walk in \( 2 \frac{1}{4} \) hours?

   b) How long would it take her to walk 5 miles?
5.11 Homework

Solve the problems using cross multiplication

1. \( \frac{3}{8} = \frac{f}{6} \)

2. \( \frac{9}{4} = \frac{1}{n} \)

3. A recipe for four people uses \( 2 \frac{1}{2} \) cups of flour.
   
a) How much flour is required to serve 15 people?

b) How many people will 8 cups of flour feed?

c) How much flour is used per person?

d) Model the proportional relationship with an equation
4. Beth jogged $2 \frac{1}{4}$ miles in $\frac{3}{4}$ hour.

   a) At this rate, how many miles would she jog in $2 \frac{1}{4}$ hours?

   b) How long would it take her to jog 5 miles?
5.12 Homework

1. Jenny is a member of a summer swim team. 
   a. Using the graph, determine how many calories she burns in one minute.

   b. Determine the equation that models the number of calories Jenny burns within a certain number of minutes.

   c. How long will it take her to burn off a 480-calorie smoothie that she had for breakfast?
2. During summer vacation, Lydie spent time with her grandmother picking blackberries. They decided to make blackberry jam for their family. Her grandmother said that you must cook the berries until they become juice and then combine the juice with the other ingredients to make the jam.

   a. Use the table below to determine the constant of proportionality of cups of juice to cups of blackberries.

<table>
<thead>
<tr>
<th>Cups of Blackberries</th>
<th>Cups of Juice</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>$\frac{1}{3}$</td>
</tr>
<tr>
<td>8</td>
<td>$\frac{2}{3}$</td>
</tr>
<tr>
<td>12</td>
<td>8</td>
</tr>
</tbody>
</table>

   b. Write an equation that models the relationship between the number of cups of blackberries and the number of cups of juice.

   c. How many cups of juice were made from 12 cups of berries?

   d. How many cups of berries are needed to make 8 cups of juice?
5.13 Homework

1. The ratio of the number of miles run to the number of miles biked is equivalent for each row in the table.
   a. Complete the table.

<table>
<thead>
<tr>
<th>Distance Run (miles)</th>
<th>Distance Biked (miles)</th>
<th>Total Amount of Exercise (miles)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>(\frac{3}{2})</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>(\frac{5}{2})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(\frac{2}{8})</td>
<td>(\frac{1}{3})</td>
<td></td>
</tr>
</tbody>
</table>
5.13 Homework

2. The following table shows the number of cups of milk and flour that are needed to make biscuits. Complete the table.

<table>
<thead>
<tr>
<th>Milk (cups)</th>
<th>Flour (cups)</th>
<th>Total (cups)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10.5</td>
<td></td>
</tr>
<tr>
<td>12.5</td>
<td>15</td>
<td>11</td>
</tr>
</tbody>
</table>
5.14 Homework

After taking a cooking class, you decide to try out your new cooking skills by preparing a meal for your family. You have chosen a recipe that uses gourmet mushrooms as the main ingredient. Using the graph below, complete the table of values and answer the following questions.

<table>
<thead>
<tr>
<th>Weight (in pounds)</th>
<th>Cost (in dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>$\frac{1}{2}$</td>
<td>4</td>
</tr>
<tr>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>$1\frac{1}{2}$</td>
<td>16</td>
</tr>
<tr>
<td>$2\frac{1}{4}$</td>
<td>18</td>
</tr>
</tbody>
</table>

a. Is this relationship proportional? How do you know from examining the graph?

b. What is the unit rate for cost per pound?

c. Write an equation to model this data.

d. What ordered pair represents the unit rate, and what does it mean?

e. What does the ordered pair (2, 16) mean in the context of this problem?

f. If you could spend $10.00 on mushrooms, how many pounds could you buy?

g. What would be the cost of 30 pounds of mushrooms?
5.15 Homework

1. Your mother has accelerated onto the interstate beginning a long road trip, and you notice that the low fuel light is on, indicating that there is a half a gallon left in the gas tank. The nearest gas station is 26 miles away. Your mother keeps a log where she records the mileage and the number of gallons purchased each time she fills up the tank. Use the information in the table below to determine whether you will make it to the gas station before the gas runs out. You know that if you can determine the amount of gas that her car consumes in a particular number of miles, then you can determine whether or not you can make it to the next gas station.

Mother’s Gas Record

<table>
<thead>
<tr>
<th>Gallons</th>
<th>Miles Driven</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>224</td>
</tr>
<tr>
<td>10</td>
<td>280</td>
</tr>
<tr>
<td>4</td>
<td>112</td>
</tr>
</tbody>
</table>

a. Find the constant of proportionality, and explain what it represents in this situation.

b. Write an equation that will relate the miles driven to the number of gallons of gas.

c. Knowing that there is a half gallon left in the gas tank when the light comes on, will she make it to the nearest gas station? Explain why or why not.

d. Using the equation, determine how far your mother can travel on 18 gallons of gas.

e. Using equation, determine how many gallons of gas would be needed to travel 750 miles.