

Name: _____

Date: _____

Aim: How can we write equations for proportional relationships?

Do Now

The graph at the left has the equation $y = 4x$. Substitute the values of x given to you in the table to find each y -value.

x	y
1	
5	
10	
15	
20	
25	

- a.) Is the table proportional? How do you know?
- b.) What is the constant of proportionality?
- c.) Use the equation to determine the value of y if $x = 300$?
- d.) Where do you see the constant of proportionality in the equation?

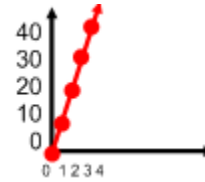
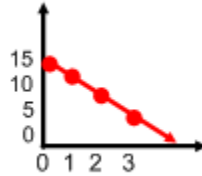
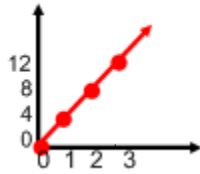
The equation to represent any proportional relationship is

If two quantities x and y have a proportional relationship, we say that they _____.

In each example below, (i) state whether proportionality or not, (ii) write the constant of proportionality and (iii) write the equation of the table. Then, write the equation of the table.

<table border="1"> <thead> <tr> <th>x</th> <th>y</th> </tr> </thead> <tbody> <tr><td>2</td><td>12</td></tr> <tr><td>3</td><td>18</td></tr> <tr><td>4</td><td>24</td></tr> <tr><td>6</td><td>36</td></tr> <tr><td>8</td><td>48</td></tr> </tbody> </table>	x	y	2	12	3	18	4	24	6	36	8	48	<table border="1"> <thead> <tr> <th>x</th> <th>y</th> </tr> </thead> <tbody> <tr><td>2</td><td>10</td></tr> <tr><td>5</td><td>15</td></tr> <tr><td>10</td><td>20</td></tr> <tr><td>25</td><td>25</td></tr> <tr><td>30</td><td>60</td></tr> </tbody> </table>	x	y	2	10	5	15	10	20	25	25	30	60	<table border="1"> <thead> <tr> <th>x</th> <th>y</th> </tr> </thead> <tbody> <tr><td>2</td><td>14</td></tr> <tr><td>3</td><td>21</td></tr> <tr><td>4</td><td>28</td></tr> <tr><td>6</td><td>42</td></tr> <tr><td>7</td><td>49</td></tr> </tbody> </table>	x	y	2	14	3	21	4	28	6	42	7	49	<table border="1"> <thead> <tr> <th>hours</th> <th>miles</th> </tr> <tr> <th><i>h</i></th> <th><i>m</i></th> </tr> </thead> <tbody> <tr><td>2</td><td>4</td></tr> <tr><td>3</td><td>6</td></tr> <tr><td>4</td><td>8</td></tr> <tr><td>5</td><td>10</td></tr> <tr><td>6</td><td>12</td></tr> </tbody> </table>	hours	miles	<i>h</i>	<i>m</i>	2	4	3	6	4	8	5	10	6	12	<table border="1"> <thead> <tr> <th>ounces</th> <th>dollars</th> </tr> <tr> <th><i>z</i></th> <th><i>d</i></th> </tr> </thead> <tbody> <tr><td>0.5</td><td>1.5</td></tr> <tr><td>1</td><td>3</td></tr> <tr><td>1.5</td><td>4.5</td></tr> <tr><td>2</td><td>6</td></tr> <tr><td>2.5</td><td>7.5</td></tr> </tbody> </table>	ounces	dollars	<i>z</i>	<i>d</i>	0.5	1.5	1	3	1.5	4.5	2	6	2.5	7.5	<table border="1"> <thead> <tr> <th>sec</th> <th>ft.</th> </tr> <tr> <th><i>s</i></th> <th><i>f</i></th> </tr> </thead> <tbody> <tr><td>1</td><td>8</td></tr> <tr><td>2</td><td>16</td></tr> <tr><td>3</td><td>24</td></tr> <tr><td>4</td><td>32</td></tr> <tr><td>5</td><td>40</td></tr> </tbody> </table>	sec	ft.	<i>s</i>	<i>f</i>	1	8	2	16	3	24	4	32	5	40
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State whether the graph shows a proportional relationship. If proportional, write the equation of the graph.



The table shows how the number of people who can ride a rollercoaster depends on the number of cars on the rollercoaster.

Number of Cars	Number of People
3	18
5	30
6	36
8	48

1.) Find the ratio of the number of people to the number of rollercoaster cars for each set of data in the table.

2.) Are the ratios in a proportional relationship? Explain your reasoning.

3.) How many people can ride in 1 car?

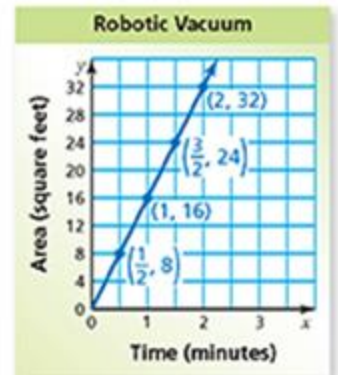
4.) What is the constant of proportionality for the data in the table?

5.) How many people can ride in 10 cars?

6.) Write an equation to represent the number of people, y , that can ride the rollercoaster with x cars.

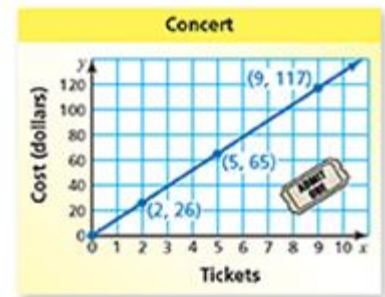
7.) Use the equation to predict how many people could fit on 25 cars.

8.) The graph below shows the area (in sq. ft) that a robotic vacuum cleans in x minutes.



- Is there a proportional relationship between the area cleaned and time? How do you know?
- What is the constant of proportionality of the graph?
- Write the equation that represents the data.
- Use your equation to find the area cleaned by the vacuum in 10 minutes.

9.) The graph below shows the cost of buying concert tickets.



- Is there a proportional relationship between the number of tickets purchased and the cost? How do you know?
- If you answered yes to part a, find the constant of proportionality and then write an equation to represent the relationship.
- Use the equation to find the cost of 15 concert tickets.

10.) The table shows the profit y for recycling x pounds of aluminum.

Aluminum (lb), x	10	20	30	40
Profit, y	\$4.50	\$9.00	\$13.50	\$18.00

- Is there a proportional relationship between x and y ?
- If it is proportional, what is the constant of proportionality?
- Write an equation to represent the situation
- Use the equation to find the profit for recycling 55 pounds of aluminum.

10.) What is the constant of proportionality in the equation $y = 7x$?

11.) What is the constant of proportionality in the equation $3y = 12x$?

12.) What is the constant of proportionality in the equation $y + 9x = 0$?