## Section 5-5: Direct Variation

Direct Variation is a special Linear Function.

• It has a constant ratio 
$$\frac{Y}{X} = k$$

k = the Variation Constant

• Direct Variation Equation:

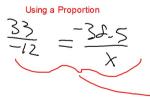
$$\frac{y}{x} = k$$
 or  $y = kx$ 

## Given the table shows a direct variation relationship, find the value of ?.

To solve Direct Variation situations you can use either equation or you can use a Proportion

X Y 20 55 12 33 ? -38.5

Vsing a Direct Variation Equation



 $\frac{-38.5}{-2.75} = \frac{-2.75}{-2.75}$ 

**Direct Variation Equations:** 

$$\frac{y}{x} = k$$
 or  $y = kx$ 

Does each equation represent Direct Variation?

1. y-3=xIf you rearrange this equation into y= form you get: y=x+3 this is not the same as y=kx and y=x+3 doesn't go through the origin.

3. 4x - 2y = 10 NO If you rearrange this equation into y= form

you get: y = -2x - 5

this is not the same as y = kxand y = x + 3 doesn't go through the origin. 2. 4y = -12x From rearrange this equation into v= form

If you rearrange this equation into y= form you get: y = -3x which IS the same as y = kx

 $4. \quad 6x + 12y = 0 \quad \forall \not \in \varsigma$ 

If you rearrange this equation into y= form you get: y = -0.5x which IS the same as y = kx

The data below comes from a Direct Variation relationship.

		١.,
Χ	Y	$\frac{4}{x}$
-5	-31.5	6,3=K
-2.4	-15.12	
4.5	28.35	
7	44.1	
11	69.3	

1. Write a Direct Variation Equation.

Y=6.3x or \(\frac{7}{x}\) =6.3

2. Find x when y = 30

30-6.3X 6.3 6.3 x=4.76

3. Find y when x = 20

Y=6.3(20) J=126 The given point is part of a Direct Variation relationship. Write the equation for each Direct Variation relationship.

5. (9,5)

$$K = \frac{x}{2} = \frac{4}{2}$$

Remember the phrase: "Y varies directly with X"

The ordered pairs are for the same Direct Variation relationship. Write a direct variation equation then find the missing value.

OR use a

7. (2,5)&(x,16)

8. (10,y)&(-3,75)

$$\frac{y}{10} = \frac{75}{-3}$$

The number of tires a company can make varies directly with the number of employees at work that day. One a recent day the company had 32 workers present and they produced 776 tires.

1. Find the Variation Constant, include units.

 $\mathcal{G} = 24.75 \times 2.$  Write a Direct Variation Equation.

3. Find the number of Employees that would be needed to make

1200 tires.

$$\begin{array}{c}
1200 \text{ tires.} \\
\hline
2007 \\
\hline
X
\end{array}$$
Or use a Direct Variation Equation

Use a Proportion

 $\begin{array}{c}
1200 \\
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The amount of money raised varies directly with the number of people who contribute. \$1746 was raised when 24 people contributed.

1. Find the variation constant, including units.

$$K = \frac{4}{x} = \frac{1746}{24 \text{ People}} = $72.75/\text{person}$$

2. Find the number of people it would take to raise
\$10,000
Use a proportion or use a Direct Variation Equation

