

#### 4.6: Direct Variation

“I WILL

...identify an equation to Direct Variation.”

##### I. Direct Variation

A. Direct Variation: A linear function which two variables are which one is a constant multiple of the other; when one variable changes the other changes in proportion to the first.

B. Direct Variation Equation: \_\_\_\_\_ or \_\_\_\_\_

1.  $K$  = Constant of Variation or \_\_\_\_\_
2. There is \_\_\_\_ y-intercept
3.  $X$  = \_\_\_\_\_ Variable
4.  $Y$  = \_\_\_\_\_ Variable
5. If  $X$  goes \_\_\_\_,  $Y$  has to go \_\_\_\_.
6. If  $X$  goes \_\_\_\_\_,  $Y$  has to go \_\_\_\_\_.

C. KEYWORD: *VARY(ies) DIRECTLY* or *DIRECTLY PROPORTIONAL*

1. Divide the variables
2.  $Y$  \_\_\_\_\_ with  $X$
3.  $k$  is not always going to be used in all questions
4. It is used only when the problem is comparing itself

##### II. Model Problems

<p>Ex 1: Tell whether the equation, <math>2x - 3y = 0</math> represents direct variation. Identify the constant of variation.</p>	<p>Ex 2: Tell whether the equation, <math>2x + y = 3</math> represents direct variation. Identify the constant of variation.</p>	<p>Your Turn: Tell whether the equation, <math>3x + 8y = 0</math> represents direct variation. Identify the constant of variation.</p>
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<p>Ex 3: The weekly salary a woman earns, <math>S</math>, varies directly as the number of hours, <math>h</math>, which she works. Express this relation as a <u>formula</u>.</p>	<p>Ex 4: The resistance <math>R</math>, of a copper wire, varies directly as its length <math>L</math>. Write this relation as a formula using <math>k</math> as the constant of variation.</p>	<p>Your Turn: At a recycling center, computers and computer accessories can be recycled for a fee <math>f</math> based on weight, <math>w</math>. Write this relation as a formula using <math>k</math> as the constant of variation.</p>
<p>Ex 5: Would this situation be a direct variation? Your weekly pay, <math>p</math>, is directly proportional to the number of hours, <math>h</math>, she works at the record store.</p>	<p>Ex 6: Would this situation be a direct variation? If the area (<math>A</math>) of a rectangle remains constant and the width (<math>w</math>) decreases.</p>	<p>Your Turn: Would this situation be a direct variation? If the temperature is constant, the pressure of a gas (<math>P</math>) in a container varies inversely as the volume of the container (<math>V</math>).</p>
<p>Ex 7: If <math>a</math> varies directly as <math>b</math> and <math>a = 3</math> when <math>b = 24</math>, find <math>b</math> when <math>a = 10</math>.</p>	<p>Ex 8: If <math>y</math> varies directly with <math>x</math>. If <math>y = 4</math> when <math>x = 2</math>, find <math>y</math> when <math>x = -6</math>.</p>	
<p>Ex 9: If <math>y</math> varies directly as <math>x^2</math> and <math>y = 64</math> when <math>x = 2</math>, find <math>y</math> when <math>x = 8</math>.</p>	<p>Your Turn: If <math>y</math> varies directly with <math>x</math>. If <math>y = 75</math> when <math>x = 25</math>, find <math>x</math> when <math>y = 25</math>.</p>	