Warm up   **WEEK 9**

Find the slope of the line passing through the points.

a) (3, 6) and (3, 0)

$(3, 6)$ undefined

$m = \dfrac{0-6}{3-3} = \dfrac{-6}{0}$

b) (-6, 2) and (4, -2)

$(4, -2)$

$m = \dfrac{2+2}{-6-4} = \dfrac{4}{-10} = \boxed{\dfrac{-2}{5}}$

c) (-1, -1) and (-3, -6)

$(-3, -6)$

$m = \dfrac{-6+1}{-3+1} = \dfrac{-5}{-2} = \boxed{\dfrac{5}{2}}$

d) (-3, 1) and (4, 1)

$(4, 1)$

$m = \dfrac{1-1}{-3-4} = \dfrac{0}{-7} = \boxed{0}$

zero slope

Find the value of y so that the line passing through the two points has the given slope.

(-1, 5), (3, y), and m = 5

$(3, y)$

$m = \dfrac{5-y}{-1-3}$

$\dfrac{5}{1} = \dfrac{5-y}{-4}$

$5(-4) = 1(5-y)$

$-20 = 5-y$

$\underline{-5 \quad -5}$

$\dfrac{-25}{-1} = \dfrac{-y}{-1}$

$\boxed{25 = y}$

Homework Questions?

44) $(5, 7)$ $(8, y)$ $m = \boxed{\dfrac{4}{3}}$

$(8, y)$

$m = \dfrac{7-y}{5-8}$

$\dfrac{4}{3} = \dfrac{7-y}{-3}$

$4(-3) = 3(7-y)$

$-12 = 21 - 3y$

$\underline{-21 \quad -21}$

$\dfrac{-33}{3} = \dfrac{-3y}{-3}$ $\boxed{y = 11}$

On the top of your paper (by your name) rate yourself for this section:

4 - I can summarize the concepts and explain it to others

3 - I can apply the concept to answer questions correctly

2 - I can apply the concepts but with some mistakes

1 - I need help and know how to apply the concept

0 - I can't apply the concept, even with help

Rating of 0-2 is a warning signal to me that you need help

Hand Back Quizzes

4.1-4.3 → 25pts

Slope Quiz → 17pts

Rate of Change wkst

(on doc cam)

Warm Up

At 6:00pm, the temperature was 60 degrees.
At 11:00pm, it was only 45 degrees. Find the
average rate of change per hour.

$$(6, 60)$$
$$(11, 45)$$

$$m = \frac{60-45}{6-11} = \frac{15}{-5}$$

$$= -3$$

$$\boxed{-3 \; \text{deg.}/\text{hr}}$$

Homework Questions?

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4.5 Direct Variation

Goals:

- Write linear equations that represent direct variation.
- Use a ratio to write an equation for direct variation.

EQ: What is the difference between the constant of variation and the direct variation equation?

Vocabulary

Constant of variation:

$$* \quad k = \frac{y}{x}$$

Variation Constant = k
(same as slope = m)

ex: $y = 2x$
↑
$k=2$

(DV)
Direct variation:

Line must go though $(0,0)$

DV equation: $y = \textcircled{k} x$
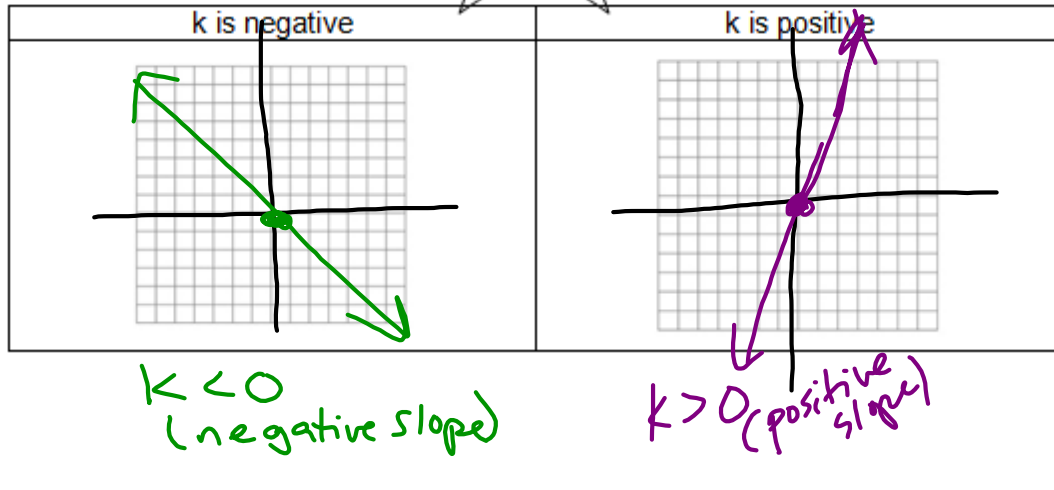
Word Problem: Y varies directly with X
#

Properties of graphs of direct variation models

The graph of $y = kx$ is a line through the _origin_.

The slope of the graph of $y = kx$ is __k__.

$$\frac{y=kx}{x} \quad \frac{kx}{x}$$

$$\frac{y}{x} = k \leftarrow \text{const of varic}$$

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

k is negative	k is positive

$k < 0$
(negative slope)

$k > 0$ (positive slope)

Example   Writing a direct variation equation

The variables x and y vary directly. When x = 7 then y = 21.

1. Write an equation that relates x and y.

$$k = \frac{y}{x} \qquad k = \frac{21}{7} = \boxed{3}$$

2. Find the value of y when x = 4.

$y = kx$

$$y = 3x$$
$$y = 3(4)$$
$$y = 12$$

6

Try It!

The variables x and y vary directly. Use the given values to write an equation that relates x and y. **Then find the value of y when x = -2.**

a) x = 6, y = 30

$$y = kx$$

$x = -2$ $y = 5x$

$$k = \frac{y}{x} = \frac{30}{6}$$

$$k = 5$$

$$y = 5(-2)$$

$$y = -10$$

b) x = 8, y = 20

$$K = \frac{y}{x}$$ $y = kx$ $x = -2$

$$k = \frac{20}{8}$$ $y = \frac{5}{2}x$ $y = \frac{5}{2}\left(\frac{-2}{1}\right)$

$$k = \frac{5}{2}$$ $y = -5$

c) x = 3.6, y = 1.8 $y = kx$

$$k = \frac{y}{x}$$ $y = \frac{1}{2}x$ $x = -2$

$$k = \frac{1.8}{3.6}$$ $y = \frac{1}{2}(-2)$

$$k = 0.5 = \frac{1}{2}$$ $y = -1$

Solve the proportion.

$$\frac{10}{8} = \frac{n}{10}$$

$$10(10) = 8(n)$$

$$\frac{100}{8} = \frac{8n}{8}$$

$$\frac{25}{2} = n$$

$$\frac{7}{4} = \frac{8}{7}$$

$$n(8) = 7(7)$$

$$\frac{8n}{8} = \frac{49}{8}$$

$$n = \frac{49}{8}$$

$$\frac{4}{9} = \frac{r-3}{6}$$

$$6(4) = 9(r-3)$$

$$24 = 9r - 27$$

$$+27 \qquad +27$$

$$\frac{51}{9} = \frac{9r}{9}$$

$$\frac{17}{3} = r$$

$$\frac{4}{m-8} = \frac{8}{2}$$

$$4(2) = 8(m-8)$$

$$8 = 8m - 64$$

$$+64 \qquad +64$$

$$\frac{72}{8} = \frac{8m}{8}$$

$$m = 9$$

Try It!

$$\frac{7}{5} = \frac{x}{3}$$

$$3(7) = 5x$$

$$\boxed{x = \frac{21}{5}}$$

$$\frac{5}{6} = \frac{7n+9}{9}$$

$$5(9) = 6(7n+9)$$

$$45 = 42n + 54$$
$$-54 \qquad -54$$
$$\frac{-9}{42} = \frac{42n}{42}$$

$$\boxed{n = \frac{-3}{14}}$$

$$\frac{4}{3} = \frac{8}{x}$$

$$8(3) = 4x$$

$$\boxed{x = 6}$$

$$\frac{6}{b-1} = \frac{9}{7}$$

$$6(7) = 9(b-1)$$

$$b = \frac{17}{3}$$

Summary

EQ: What is the difference between the constant of variation and the direct variation equation?

4.5 Homework

#1-10 on back side of yesterday's hw
(5.3 Practice Masters A)

& 4.5 Practice B wkst #1-22
(show work on separate sheet,
#4-9 use graph paper)