HW: Worksheet/2, 4, 6, 7, 9

Warm up:

Graph

1) $f(x) = 2x^2 - 8x + 3$

$-\frac{-8}{2(2)} = -\frac{-8}{4} = 2$

$f(2) = -5$

2) $g(x) = 7 - 3x^2$

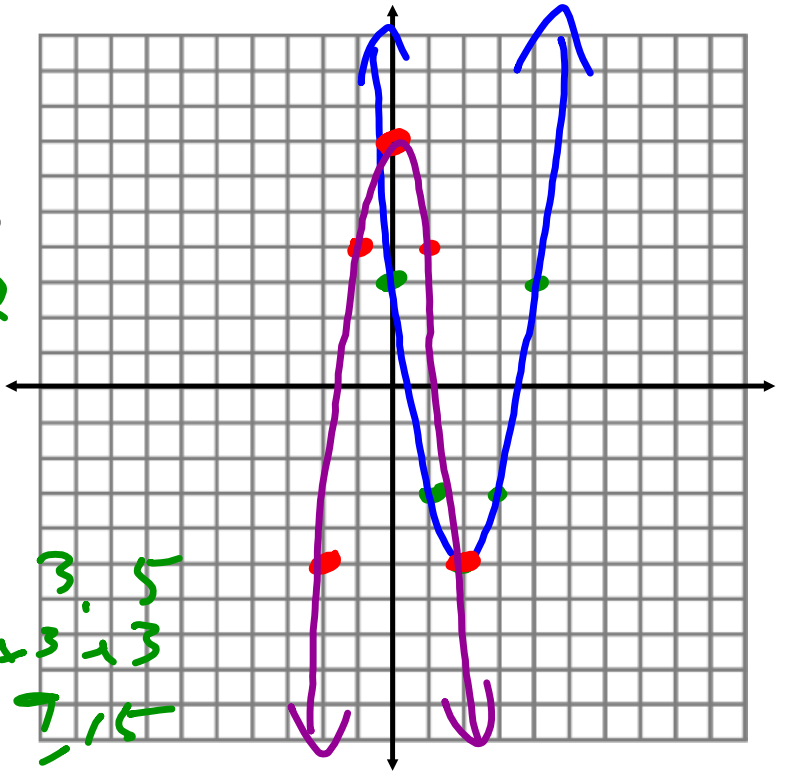
$-\frac{0}{2(-3)} = 0$

$g(0) = 7$

1, 3, 5

x3 x3 x3

3, 7, 15



A direct variation is a function defined by an equation of the form:

$$y = kx$$

$y = 2x$
$y = 3x$
$y = 14x$

constant of variation

Where k is a non-zero constant

"y varies directly as x"

What does the graph of a direct variation function look like?

goes through the origin

What is the constant of variation?

slope

t varies directly as s and t = 16 when s = 2. Write an equation to find the constant of variation. Then find t when s=5.

$t = ks$

$\frac{16}{2} = \frac{k \cdot 2}{2}$

$8 = k$

$t = 8s$

$40 = 8(5)$

$t = 40$

y varies directly as x and y = 12 when x = 2. Write an equation to find the constant of variation. Then find x when y = 7.

$y = kx$

$\frac{12}{2} = \frac{k \cdot 2}{2}$

$6 = k$

$y = 6x$

$\frac{7}{6} = \frac{6x}{6}$

$\frac{7}{6} = x$

The amount Rodney earns varies directly with the number of hours he works. If Rodney earns $112 for 14 hours of work, write an equation that relates y, the amount Rodney earns, with x, the number of hours he works, find the amount he will earn if he works 35 hours next week, and explain the meaning of the constant of variation in this problem.

$y = kx$

$\frac{112}{14} = \frac{k \cdot 14}{14}$

$8 = k$

$\$8/h$

$y = 8 \cdot 35$

$= 280$

$\$280$

$\frac{112}{14} = \frac{x}{35}$

$\frac{56}{7} = \frac{x}{35}$

Directly Proportional

An employee's wages are directly proportional to the time worked. If an employee earns $100 for 5h, how much will they earn for 18h?

$\frac{5}{18} = \frac{100}{x}$

$\frac{5}{100} = \frac{18}{x}$

$\frac{5x}{5} = \frac{1800}{5}$

$x = 360$

$360

$y = kx$

$\frac{100}{5} = \frac{k \cdot 5}{5}$

$20 = k$

$18 \cdot 20 = 360$

HW Solutions

(3) $y + 2 = \frac{1}{6}(x - 4)$

$6(y + 2) = (\frac{1}{6}x - \frac{4}{6})6$

$6y + 12 = x - 4$

$-12 \quad -12$

$\frac{6y}{6} = \frac{x - 16}{6}$

$y = \frac{1}{6}x - \frac{8}{3}$

$$10(y+7)=\left(\frac{9}{10}(x+3)\right)10$$

$$10y+70=9(x+3)$$

$$10y+70=9x+27$$

$$-9x \quad -70 \quad -9x \quad -70$$

$$-9x+10y=-43$$

$$\times(-1) \qquad \times(-1)$$

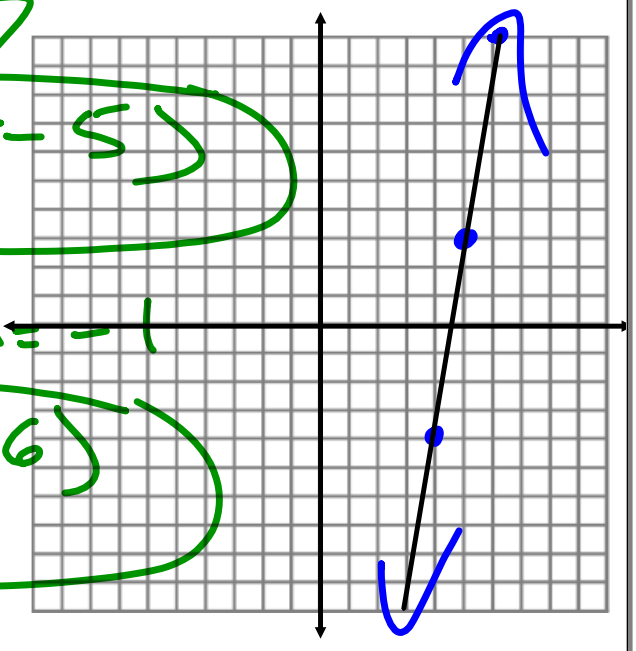
$$9x-10y=43$$

(11) $(5, 3)$ $m = 7$

$y - 3 = 7(x - 5)$

(13) $(-6, -3)$ $m = -1$

$y + 3 = -(x + 6)$



Q9

$$y + 5 = -6(x + 7)$$

$$y + 5 = -6x - 42$$

$$-5 \qquad\qquad -5$$

$$y = -6x - 47$$

(2) $y - 9 = -6(x + 9)$

$y - 9 = -6x - 54$

$+6x \quad +9 \quad +6x \quad +9$

$6x + y = -45$

(25) $2y + 3 = -\frac{1}{3}(x - 2)$

$3(2y + 3) = (-\frac{1}{3}x + \frac{2}{3})3$

$6y + 9 = -x + 2$

$+x \quad -9 \quad +x \quad -9$

$x + 6y = -7$

(27) $y - 6 = -2(x - 7)$

$y - 6 = -2x + 14$

$+6 \qquad +6$

$y = -2x + 20$

(9) $y - 10 = 2(x-8)$

$y - 10 = 2x - 16$

$-2x + 10 \quad -2x + 10$

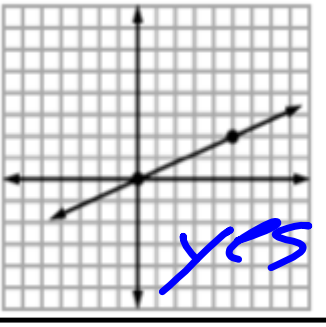
$-2x + y = -6$

$\times(-1) \quad \times(-1)$

$2x - y = 6$

Determine if each line is an example of direct variation.

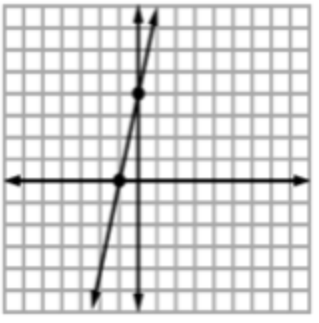
1) 

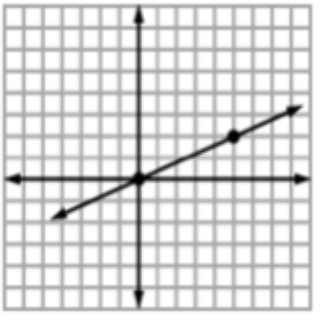
2) 

pg. 395/3, 5

The cost of potato salad at the deli varies directly as the number of pounds purchased. If 4 pounds of potato salad cost $10, write an equation that relates y, the cost, with x, the number of pounds purchased, find the cost of purchasing 9 pounds of potato salad, and explain the meaning of the constant of variation in this problem.

Determine if each line is an example of direct variation.

1) 

2) 

3) The amount of money that a magazine pays for an article varies directly as the number of words in the article. If the magazine pays$720 for a 1200-word article, how much will be paid for an article of 1500 words?

$$\frac{720}{1200} = \frac{x}{1500}$$

$$\frac{1200x}{1200} = \frac{1080000}{1200}$$

$$x = 900$$

$900

5) The number of words typed is directly proportional to the time spent typing. If a typist can type 275 words in 5 min, how long will it take the typist to type a 935-word essay?

$$\frac{275}{5} = \frac{935}{x}$$

$$\frac{275x}{275} = \frac{4675}{275}$$

$$x = 17$$

17 min

The cost of potato salad at the deli varies directly as the number of pounds purchased. If 4 pounds of potato salad cost $10, write an equation that relates y, the cost, with x, the number of pounds purchased, find the cost of purchasing 9 pounds of potato salad, and explain the meaning of the constant of variation in this problem.

$y = kx$

$\frac{10}{4} = \frac{k \cdot 4}{4}$

$2.5 = k$

$2.50/lb

$9 \cdot 2.50$

$22.50

February 10, 2022