

1. The number of shots Susan makes is a function of how many shots she takes. She makes 70% of her shots.

EQ:

$$y = .70x$$

Variables:

$$y = \text{shots made}$$

$$x = \text{shots taken}$$

2. Yolanda's monthly paycheck includes her \$1200 salary plus 5% of her total sales for that month.

EQ:

$$y = 1200 + 0.05x$$

Variables:

$$y = \text{pay}$$

$$x = \text{months.}$$

3. Hussein's business mails out coupons to houses in the city. It costs him \$.39 for each envelope mailed.

EQ:

$$y = .39x$$

Variables:

$$y = \text{total \$}$$

$$x = \text{envelopes.}$$

4. Write a function rule for the data in each table.

a)

X	Y
-5	18
-2	7.2
0	0
7	-25.2
11	-39.6

$$y = mx$$

$$y = mx + b$$

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

$$m = -3.6$$

$$y = -3.6x$$

b)

X	Y
-3	1.5
-1	3.5
2	6.5
5	9.5
7	11.5

$$y = x + 4.5$$

c)

X	Y
-4	29
-3	25
-1	17
0	13
2	5

$$y = -4x + 13$$

$$\begin{aligned}
 y &= mx + b \\
 y &= mx + 13 \\
 5 &= 2m + 13 \\
 -8 &= 2m \\
 m &= -4
 \end{aligned}$$

Hwk #32 Answers

1. $y = x + 3$

2. $y = 3x$

3. $y = x - 5$

4.

a. $y = 0.39x$; $y = \text{cost}$, $x = \# \text{ of pounds}$

b. $y = 0.39(3.5) = \$1.37$

5.

a. $y = 50 + 10x$; $y = \text{cost}$, $x = \# \text{ of ppl.}$

b. $y = 50 + 10(6) = \$110$

6. $y = x/2$

7. $y = x^2$

8. $y = -x + 20$

9.

a. $T = 12b$; $T = \text{total \# of pens}$, $b = \# \text{ of boxes}$

b. $T = 12(16) = 192 \text{ pens}$

10.

a. $y = 20 - 1.25x$; $y = \text{change}$, $x = \text{price of item}$

b. $y = 20 - 1.25(5) = 20 - 6.25 = \13.75

c. No. Price limit goes over the \$20 bill.

11.

a. $P = 9.50s - 209$; $P = \text{profit}$; $s = \text{shirts sold}$

b. $P = 9.50(24) - 209 = \$19$

c. 22 shirts

Write a function rule for each table.

1.

x	$f(x)$
0	3
2	5
4	7
6	9

2.

x	$f(x)$
0	0
1	3
3	9
5	15

3.

x	$f(x)$
5	0
10	5
15	10
20	15

4. a. Write a function rule to calculate the cost of buying bananas at \$.39 a pound.

b. How much would it cost to buy 3.5 pounds of bananas?

5. To rent a cabin, a resort charges \$50 plus \$10 per person.

a. Write a function rule to calculate the total cost of renting the cabin.

9. Pens are shipped to the office supply store in boxes of 12 each.

rule to find the total cost for six people to stay in

a. Write a function rule to calculate the total number of pens when you know the number of boxes.

b. Calculate the total number of pens in 16 boxes.

10. a. Write a function rule to determine the change you would get from a \$20 bill when purchasing items that cost \$1.25 each.

b. Calculate the change when five of these items are purchased.

c. Can you purchase 17 of these items with a \$20 bill?

11. You invest \$209 to buy shirts and then sell them for \$9.50 each.

a. Write a function rule to determine your profit.

b. Use your rule to find your profit after selling 24 shirts.

c. How many shirts do you need to sell to get back your investment?

x	$f(x)$
-3	9
0	0
1	1
5	25

8.

x	$f(x)$
0	20
2	18
4	16
8	12

Section 5-5: Direct Variation

Objectives:

- 1.) I can write an equation of a direct variation.
- 2.) I can use ratios and proportions with direct variations.

Direct Variation is a special Linear Function.

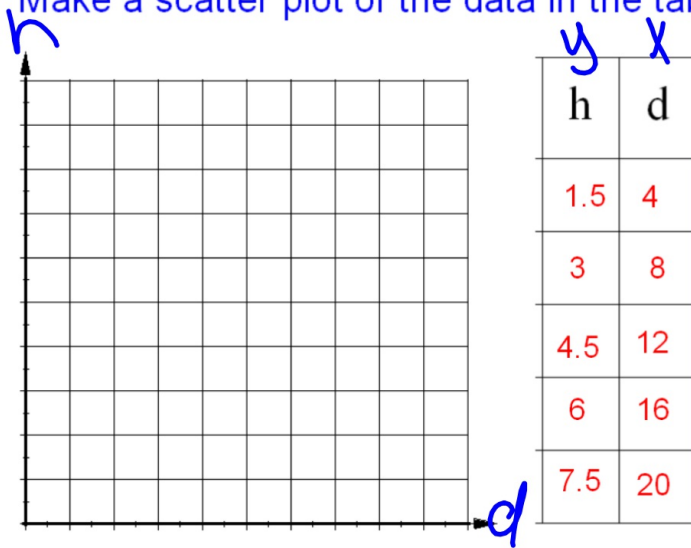
• It has a constant ratio $\frac{Y}{X} = k$

k = the Variation Constant

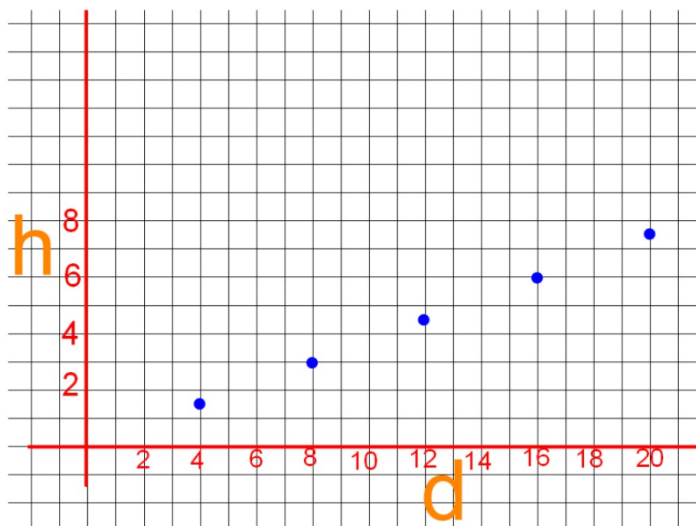
• Direct Variation Equation:

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

Make a scatter plot of the data in the table.



x, y
 d, h



Graph of direct variation

- The graph must be a line that passes through the origin.

Does each table of values represent a Direct Variation relationship?

1. NO

X	Y
6	28.5
11	52.25
19	89
26	119.6
42	201.6

4.75
4.75
4.69

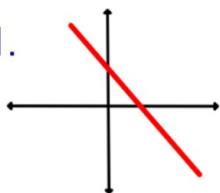
2. NO.

X	Y
4	5.4
14	18.9
22	21.6
27	36.45
34	45.9

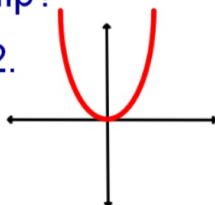
1.35
1.35
.98

Does each graph represent a Direct Variation relationship?

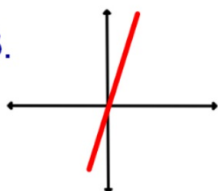
1.



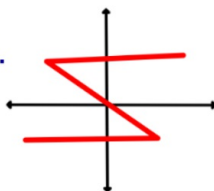
2.



3.



4.



Direct Variation Equations:

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

Is each equation direct variation?
If yes, find the variation constant.

1. $4x + 2y = 10$ *No*

-4x -4x

2y = -4x + 10

y = -2x + 5

*has a
y int.*

2. $6 + 7y = 5 - 3x + 1$

6 + 7y = 6 - 3x

7y = -3x

y = $-\frac{3}{7}x$

*yes
k = $-\frac{3}{7}$*

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

To solve Direct Variation situations you can use either equation ① or you can use a Proportion ②

X	Y
4	9
10	22.5
24	54
35	?

① $k = \frac{9}{4}$

$k = 2.25$

$y = 2.25x$

$y = 2.25(35)$

② $\frac{9}{4} = \frac{y}{35}$

$315 = 4y$

78.75

1. Use this table to write a Direct Variation equation.

X	Y
2	12.2
9	54.9
15	91.5
18	109.8
23	140.3

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

$k = 6.1$ $y = 6.1x$

2. Find the value of x when y=50

$50 = 6.1x$

$x = 8.2$

3. Find the value of y when x=20

$y = 6.1(20) = 122$

Remember the phrase: "Y varies directly with X"

The amount of water in the tub varies directly with the amount of time the water has running. After 5 minutes there are 12 gallons in the tub.

1. Model this situation with a Direct Variation equation.

$$y = 2.4x$$

2. Find the amount of time it takes to fill a 32 gallon tub.

$$k = \frac{12}{5}$$

$$k = 2.4$$

$$32 = 2.4x$$

$$x = 13.\bar{3} \text{ min}$$

The number of air conditioners built varies directly with the number of workers in the factory.

When there are 120 workers on the job 270 air conditioners are manufactured.

1. What is the variation constant?

$$k = \frac{y}{x} = \frac{270}{120} = 2.25$$

2. Write a direct variation equation to model this situation.

$$y = 2.25x$$

3. Find the number of air conditioners that can be produced if there are 140 workers present

$$y = 2.25(140) \\ = 315 \text{ air cond.}$$

The point (6, 11) is on the graph of a direct variation relationship.

$$h = \frac{11}{6}$$

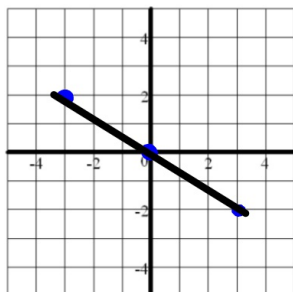
Write an equation for this Direct Variation.

$$y = \frac{11}{6}x$$

$$y = 1.8\bar{3}x$$

Graphing Direct Variation.

1. Graph the direct variation that contains the point (-3, 2)



$$y = -\frac{2}{3}x$$

Each of the ordered pairs given are for the same direct variation. Find the missing value.

1. (4,18) and (x, 45)

① PROP.

$$\frac{18}{4} = \frac{45}{x}$$

② Eqn.

$$18x = 180$$

$$x = 10$$

$$k = \frac{18}{4}$$

$$= 4.5$$

$$y = 4.5x$$

$$45 = 4.5x$$

$$x = 10$$

2. (18,6) and (24,y)

$$\frac{6}{18} = \frac{y}{24}$$

$$18y = 144$$

$$y = 8$$

You can now finish Hwk #33 (due Thursday)

Sect. 5.5

Pages: 264-265

Problems: 12, 13, 23-26, 37, 41, 45

IXL #13 - Q.2 & Q.10 due Friday at 4pm!