

Lesson 1 Skills Practice

Constant Rate of Change

Determine whether the relationship between the two quantities described in each table is linear. If so, find the constant rate of change. If not, explain your reasoning.

1.

Hours Spent Babysitting	Money Earned (\$)
1	10
3	30
5	50
7	70

$\frac{20}{2} = 10$
 $\frac{20}{2} = 10$
 $\frac{20}{2} = 10$

LINEAR, \$10 per hour

2.

Time (min)	Temperature (°F)
9	60
10	64
11	68
12	72

$\frac{4}{1} = 4$
 $\frac{4}{1} = 4$
 $\frac{4}{1} = 4$

LINEAR, 4° per hour

3.

Number of Students	Number of Magazines Sold
10	100
15	110
20	200
25	240

$\frac{10}{5} = 2$
 $\frac{90}{5} = 18$

Not linear

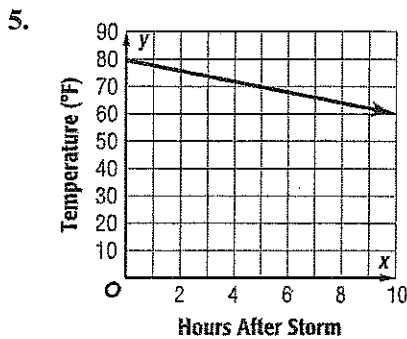
4.

Number of Trees	Number of Apples
5	100
10	120
15	150
20	130

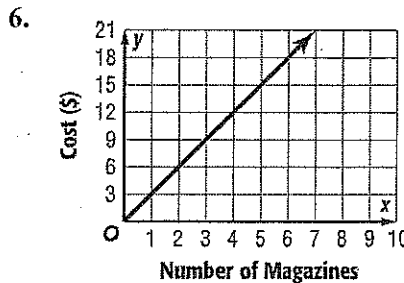
$\frac{20}{5} = 4$
 $\frac{30}{5} = 6$

Not linear

Determine whether a proportional relationship exists between the two quantities shown in each graph. Explain your reasoning.



No, it does not pass through the origin



Yes, it is a straight line that passes through the origin

Lesson 3 Homework Practice

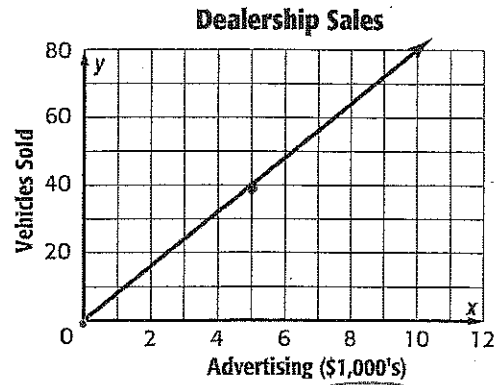
Equations in $y = mx$ Form

1. **ADVERTISING** The number of vehicles a dealership sells varies directly with the money spent on advertising. How many vehicles does the dealership sell for each \$1,000 spent on advertising?

(solve for slope)

$(0, 0)$ $(5, 40)$

$\frac{40-0}{5-0} = \frac{40}{5} = 8$ vehicles



2. **SNOWMOBILES** Bruce rents snowmobiles to tourists. He charges \$135 for 4 hours and \$202.50 for 6 hours. What is the hourly rate Bruce charges to rent a snowmobile? $\$33.75$

3. **SOLAR ENERGY** The power absorbed by a solar panel varies directly with its area. If an 8 square meter panel absorbs 8,160 watts of power, how much power does a 12 square meter solar panel absorb? $12,240$ watts

4. **INSECT CONTROL** Mr. Malone used 40 pounds of insecticide to cover 1,760 square feet of lawn and 60 pounds to cover an additional 2,640 square feet. How many pounds of insecticide would Mr. Malone need to cover his whole lawn of 4,480 square feet? ≈ 101.8 lb.

Determine whether each linear function is a direct variation. If so, state the constant of variation.

5.

Volume, x	2	4	6	8
Mass, y	10	20	30	40

Yes; 5 $\frac{10}{2} = 5$ $\frac{20}{4} = 5$ $\frac{30}{6} = 5$ $\frac{40}{8} = 5$

6.

Gallons, x	5	10	15	20
Miles, y	95	190	285	380

Yes; 19

7.

Time, x	8	9	10	11
Temp, y	68	71	74	77

No $\frac{68}{8} = 8.5$ $\frac{71}{9} = 7.8$

8.

Age, x	3	6	9	12
Height, y	28	40	52	64

NO

ALGEBRA If y varies directly with x , write an equation for the direct variation. Then find each value.

9. If $y = -5$ when $x = 2$, find y when $x = 8$. $y = mx$ so, $-5 = m(2)$ $m = -\frac{5}{2}$ $y = -\frac{5}{2}x$ and $y = -\frac{5}{2}(8)$

10. Find y when $x = 1$, if $y = 3$ when $x = 2$. $y = \frac{3}{2}x$, $y = \frac{3}{2}$ $y = -20$

11. If $y = -7$ when $x = -21$, what is the value of x when $y = 9$? $y = \frac{1}{3}x$, $x = 27$

12. Find x when $y = 18$, if $y = 5$ when $x = 4$. $y = \frac{5}{4}x$ $x = \frac{72}{5}$

Lesson 5 Homework Practice

Graph a Line Using Intercepts

State the x- and y-intercepts of each function.

1. $-6x + 8y = 24$ let $y=0$ let $x=0$
 $-6x + 8(0) = 24$ $-6(0) + 8y = 24$
 $-6x = 24$ $8y = 24$
 $x = -4$ $y = 3$

3. $-\frac{1}{4}x - \frac{1}{3}y = 12$ $x = -48$ $y = -36$

5. $x + y = 1$ $x = 1, y = 1$

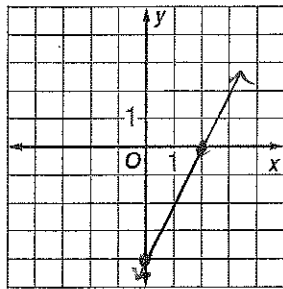
4. $-10x - 10y = -20$ $x = 2, y = 2$

6. $-x - y = \frac{1}{2}$ $x = -\frac{1}{2}, y = -\frac{1}{2}$

State the x- and y-intercepts of each function. Then graph the function.

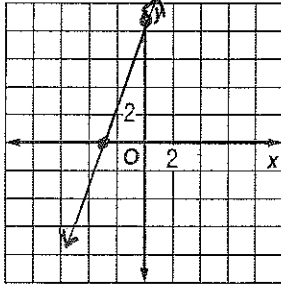
7. $-4x + 2y = -8$ let $x=0$
 $-4(0) + 2y = -8$
 $2y = -8$
 $y = -4$ (0, -4)

let $y=0$
 $-4x + 2(0) = -8$
 $-4x = -8$
 $x = 2$ (2, 0)



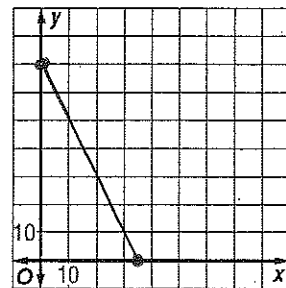
8. $6x - 2y = -18$ let $x=0$
 $6(0) - 2y = -18$
 $-2y = -18$
 $y = 9$ (0, 9)

let $y=0$
 $6x - 2(0) = -18$
 $6x = -18$
 $x = -3$ (-3, 0)



9. **FARMING** Mr. Jeans raises cows and chickens on his farm. Altogether, his cows and chickens have 140 legs. This can be represented by the function $4x + 2y = 140$. Graph the function. Then interpret the x- and y-intercepts.

$x = 35$ cows and zero chickens
 $y = 70$ chickens and zero cows



10. **MONEY** Monty has a total of \$290 in ten dollar and five dollar bills. This can be represented by the function $10x + 5y = 290$. Interpret the x- and y-intercepts.

x-int indicates he has 29 ten dollar bills and no five dollar bills
 y-int indicates he has 58 five dollar bills and no ten dollar bills

Lesson 6 Homework Practice

Write Linear Equations

Write an equation in point-slope form and slope-intercept form for each line.

1. passes through $(-5, 6)$, slope $= 3$

$$y - 6 = 3(x + 5)$$

$$y = 3x + 21$$

2. passes through $(6, -6)$, slope $= 5$

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

$$y = 5x - 36$$

3. passes through $(0, 1)$ and $(2, 5)$

$m = 2$

$$y - 5 = 2(x - 2)$$

or

$$y - 1 = 2(x - 0)$$

$$y = 2x + 1$$

4. passes through $(-5, 9)$ and $(1, 3)$

$$y - 9 = -1(x + 5) \text{ or } y - 3 = -1(x - 1)$$

$$y = -x + 4$$

5. passes through $(1, -1)$ and $(2, 0)$

$$y + 1 = 1(x - 1) \text{ or } y - 0 = 1(x - 2)$$

$$y = x - 2$$

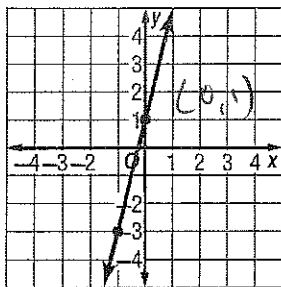
6. passes through $(-3, -5)$, slope $= 2$

$$y + 5 = 2(x + 3)$$

$$y = 2x - 1$$

Write the point-slope form of an equation for each line graphed.

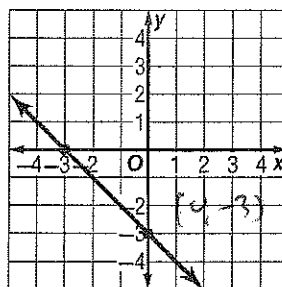
7.



$m = 4$

$$y - 1 = 4(x - 0)$$

8.



$m = -1$

$$y + 3 = -1(x - 0)$$

9. **TEMPERATURE** The table shows the temperature at certain hours. Assuming the temperature change is linear, write an equation in point-slope form to represent the temperature y at x hour.

Hour	Temperature (°F)
1	35
2	39

$$y - 35 = 4(x - 1)$$

10. **SPEED** After 2 hours, a car travels 70 miles. After 2.25 hours in the same trip, the car travels 78.75 miles. Write an equation in point-slope form to represent the distance y of the car after x hours.

$$y - 70 = 35(x - 2)$$