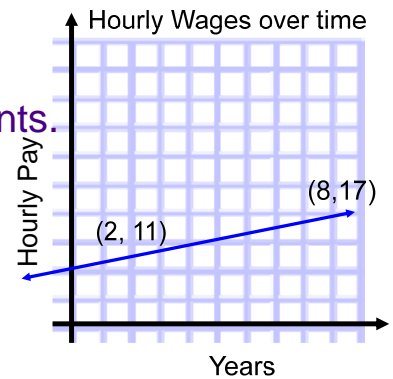


Warm-up 11-8

***Have your homework out on your desk.**

1. Over the last 50 years, the average temperature has increased by 2.5 degrees worldwide (I made this up). What is the rate of change in worldwide temperatures per year?

2. Find the slope and explain what the slope represents.



3. Find the slope of the line represented by the equation $5y = 125 + 25x$

8. A rocket is y_1 1 mile above the earth in x_1 30 seconds and y_2 5 miles above the earth in x_2 2.5 minutes. What is the rocket's rate of change in miles per second? What about miles per minute.

$$\frac{1}{30} \text{ miles/sec} \approx 0.03$$

$$\frac{\Delta y}{\Delta x} = \frac{\text{miles}}{\text{sec}}$$

$$(x_1, y_1) (x_2, y_2)$$

$$(30, 1) (150, 5)$$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{5 - 1}{150 - 30} = \frac{4}{120} = \frac{1}{30}$$

x	y
30	1
150	5

$\frac{4}{120} = \frac{1}{30}$

$$\frac{1 \text{ miles}}{30 \text{ sec}} \cdot \frac{60 \text{ sec}}{1 \text{ min}} = 2 \text{ miles/min}$$

Warm-up 11-8

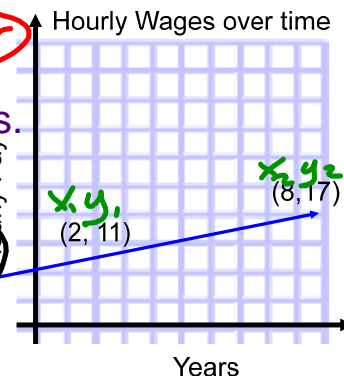
*Have your homework out on your desk.

1. Over the last 50 ^{Δx} years, the average temperature has increased by 2.5 ^{Δy} degrees worldwide (I made this up). What is the rate of change in $\frac{\Delta y}{\Delta x}$ worldwide temperatures per year?

$$\frac{2.5 \text{ deg}}{50 \text{ years}} = 0.05 \text{ degrees per year}$$

2. Find the slope and explain what the slope represents.

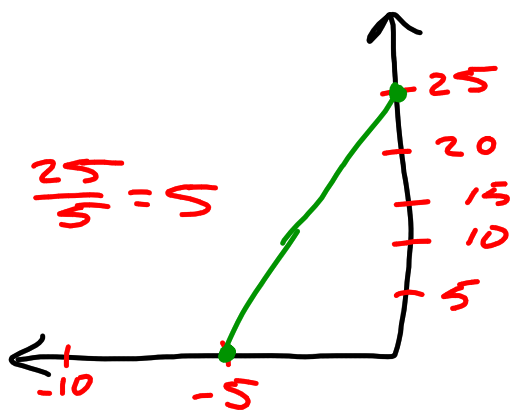
$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{17 - 11}{8 - 2} = \frac{6}{6} = 1 \text{ hourly pay per year}$$



3. Find the slope of the line represented by the equation $5y = 125 + 25x$

$$m = 5$$

$$\begin{aligned} \frac{5y}{5} &= \frac{125}{5} + \frac{25x}{5} \\ y &= 25 + 5x \\ y &= 5x + 25 \end{aligned}$$



8. A rocket is y_1 mile above the earth in x_1 seconds and y_2 miles above the earth in 2.5 minutes. What is the rockets rate of change in miles per second? What about miles per minute.

$$\frac{1}{30} \text{ miles/sec} \approx 0.03 \text{ miles/sec}$$

$$\frac{1 \text{ miles}}{30 \text{ sec}} \cdot \frac{60 \text{ sec}}{1 \text{ min}} = 2$$

$$2 \text{ miles/min}$$

x	y
30	1
150	5

$\frac{4}{120} = \frac{1}{30}$

$$x_2 = 150 \text{ sec}$$

$$\frac{\Delta y}{\Delta x} = \frac{\text{miles}}{\text{second}}$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{5 - 1}{150 - 30} = \frac{4}{120} = \frac{1}{30}$$

8. A rocket is y_1 1 mile above the earth in x_1 30 seconds and y_2 5 miles above the earth in x_2 2.5 minutes. What is the rockets rate of change in miles per second? What about miles per minute.

$$\frac{1}{30} \approx 0.03 \text{ m/s}$$

$$\frac{\Delta y}{\Delta x} = \frac{4}{120}$$

$$\frac{0.03 \text{ mi}}{\cancel{s}} \cdot \frac{60 \cancel{s}}{1 \text{ min}} = 1.8 \text{ mi/min}$$

x	y
30	1
150	5

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{5 - 1}{150 - 30} = \frac{4}{120} = \frac{1}{30} \approx 0.03$$

11. y_2 Michael started a savings account with \$300. After 4 weeks, he had \$350 dollars, and after 9 weeks, he had \$400. What is the rate of change of money in his savings account per week?

x_1 y_1 x_2
 $\$10$ per week

$$y - y_1 = m(x - x_1)$$

$$y - 350 = 10(x - 4)$$

$$y - 350 = 10x - 40$$

$$\begin{array}{r} +350 \\ \hline \end{array}$$

$$y = 10x + 310$$

$$\frac{\Delta y}{\Delta x} = \frac{\$}{\text{week}}$$

x	y
4	350
9	400

5 < 4 350 > 50

$$\frac{50}{5} = \$10/\text{week}$$

$$m = \frac{400 - 350}{9 - 4} = \frac{50}{5}$$

12. A plane left Chicago at 8:00 A.M. At 1: P.M., the plane landed in Los Angeles, which is 1500 miles away. What was the average speed of the plane for the trip?

$$\frac{1500 \text{ m}}{5 \text{ h}} = 300 \text{ m/h}$$

$$\frac{\text{m}}{\text{h}}$$

$$\frac{\Delta y}{\Delta x}$$

13. After 30 baseball games, A-Rod had 25 hits. If after 100 games he had 80 hits, what is his average hits per baseball game.

$$\frac{11 \text{ hits}}{14 \text{ games}} \approx 0.79$$

$$\frac{\Delta y}{\Delta x} = \frac{\text{hits}}{\text{game}}$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{80 - 25}{100 - 30} = \frac{55}{70} = \frac{11}{14}$$

	x	y	
	30	25	
70 <	100	80	> 55
		55	
		70	
		=	
		14	

$$y - y_1 = m(x - x_1)$$

$$y - 25 = \frac{11}{14}(x - 30)$$

$$\begin{array}{r} y - 25 = \frac{11}{14}x - \frac{330}{14} \\ +25 \qquad \qquad +25 \\ \hline y = \frac{11}{14}x + \frac{16}{7} \end{array}$$

$$y = 0.79x + 1.43$$

13. After x_1 30 baseball games, A-Rod had y_1 25 hits. If after x_2 100 games he had y_2 80 hits, what is his average hits per baseball game.

$$y = \frac{11}{14}x + 1.43$$

$$\frac{b}{g}$$

$$\frac{\Delta y}{\Delta x} = \frac{\text{dep}}{\text{ind}}$$

$$(30, 25) \quad (100, 80)$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{80 - 25}{100 - 30} = \frac{55}{70}$$

$>$	$<$	x 30 100	y 25 80	$>$	55
-----	-----	----------------------	---------------------	-----	------

$$\frac{55}{70} = \frac{11}{14} \text{ hits/game} \approx 1.27$$

$$y - y_1 = m(x - x_1)$$

$$y - 25 = \frac{11}{14}(x - 30)$$

$$y - 25 = \frac{11}{14}x - \frac{330}{14}$$

$$\begin{array}{r} +25 \qquad \qquad +25 \\ \hline \end{array}$$

$$y = \frac{11}{14}x + 1.43$$

14. (8,2) and (11,3)

14. (x_1, y_1) and (x_2, y_2) $\frac{3-2}{11-8} = \frac{1}{3}$

15. (8,0) and (8, 6)

15. (x_1, y_1) and (x_2, y_2) $\frac{6-0}{8-8} = \frac{6}{0}$ undefined



Section 4.5

Today's Goal

I can identify, write, and graph direct variation equations.

Section 4.5: Direct Variation

Direct Variation ~ a special type of linear function written in the form $y = kx$ where k is the constant of variation

$$y = 2x$$

Identifying Direct Variation Equations (if a direct variation equation identify the constant of variation)

$$y = 6x$$

YES

$$\underline{10}x = -12y$$

YES

$$2x + 7y = \textcircled{10}$$

NO

Try These!

Determine if the following are direct variation equations.

$$18y = 54x - 26$$

NO

$$20x = 4y$$

YES

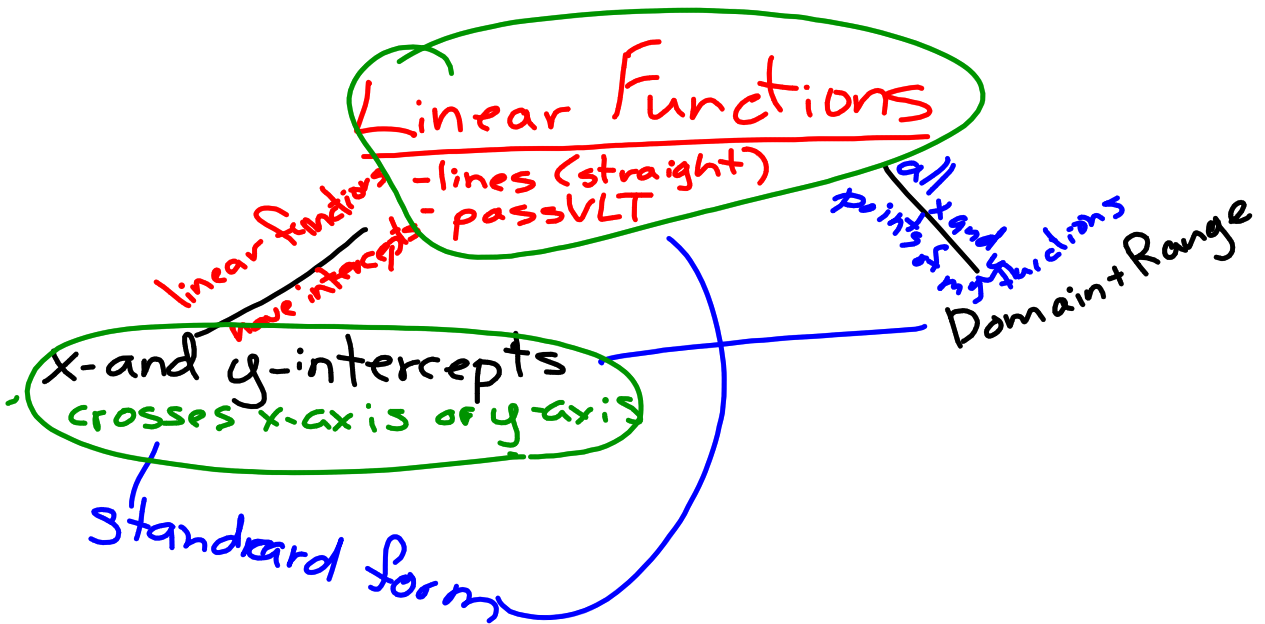
Linear Function "I can" learning targets

Name: _____

I can...

- | | |
|---|-----------|
| 1. identify linear functions and linear equations. | 1. _____ |
| 2. give the domain and range of a linear function. | 2. _____ |
| 3. graph linear functions that represent real-world situations. | 3. _____ |
| 4. find x - and y -intercepts | 4. _____ |
| 5. interpret the x - and y -intercepts meanings in real-world situations. | 5. _____ |
| 6. graph linear functions. | 6. _____ |
| 7. find rates of change/slopes | 7. _____ |
| 8. determine the meaning of rates of change/slope | 8. _____ |
| 9. find slope by using the slope formula | 9. _____ |
| 10. identify, write, and graph direct variation equations | 10. _____ |
| 11. write a linear equation in slope intercept form | 11. _____ |
| 12. write a linear equation in point-slope form | 12. _____ |
| 13. write a linear equation given two points | 13. _____ |

Word sort/connections



Review for the test.