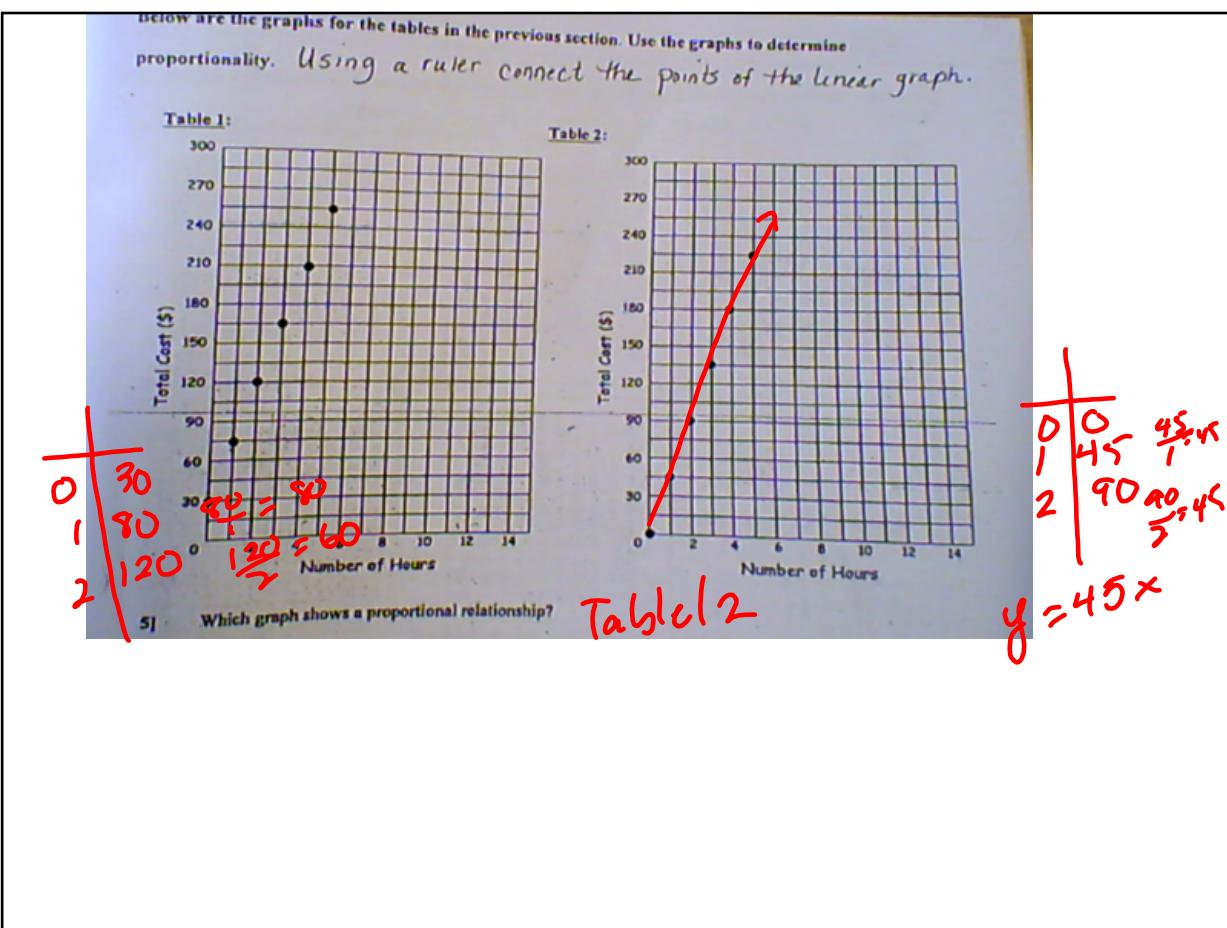


- 1) Bell Ringer: page 9
go over pages 17-19
- 2) Turn in Benchmark Review
- 3) Topic B Lesson 3: constant rate
- 4) Homework: pgs 23-25

Mar 6-11:22 AM



Mar 7-11:25 AM

6] What makes it a proportional relationship?

Conclusion:

To determine proportionality from a graph,

straight line and hits (0,0)

Determine which of the following tables represent proportional relationships.

1) **yes** 8) **yes** 9) **no** 10) **yes**

x	y
1	-3
2	-6
3	-9
4	-12
5	-15

$$y = -3x$$

x	y
-4	-8
-2	-4
0	0
2	4
4	8

$$y = 2x$$

$$y = 2(0) = 0$$

x	y
-1	-6
0	-5
1	-3
2	0
3	4

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

x	y
-1	-1.5
1	1.5
3	4.5
5	7.5
7	10.5

$$y = 1.5x$$

Mar 7-11:25 AM

Problem Set

- A train travels at a constant rate of 45 miles per hour.
 - What is the distance, d , in miles, that the train travels in t hours?
 - How many miles will it have traveled in 2.5 hours?
- Water is leaking from a faucet at a constant rate of $\frac{1}{3}$ gallons per minute.
 - What is the amount of water, w , that is leaked from the faucet after t minutes?
 - How much water is leaked after an hour?
- A car can be assembled on an assembly line in 6 hours. Assume that the cars are assembled at a constant rate.
 - How many cars, y , can be assembled in t hours?
 - How many cars can be assembled in a week?

$d = 45t$

$d = 45(2.5) = 112.5\text{ mi}$

$w = \frac{1}{3}t$

$w = \frac{1}{3}(60) = 20\text{ gal}$

Mar 7-11:26 AM

4. A copy machine makes copies at a constant rate. The machine can make 80 copies in $2\frac{1}{2}$ minutes.
- Write an equation to represent the number of copies, n , that can be made over any time interval, t .
 - Complete the table below.

t (time in minutes)	Linear equation:	n (number of copies)
0	$y =$	
0.25		
0.5		
0.75		
1		

Mar 7-11:26 AM

5. Connor runs at a constant rate. It takes him 34 minutes to run four miles.
- Write the linear equation in two variables that represents the number of miles Connor can run in any given time interval, t .
 - Complete the table below. Use a calculator and round answers to the tenths place.

t (time in minutes)	Linear equation:	m (distance in miles)
0	$y = \frac{2}{17}x$	0
15	$\frac{2}{17}(15)$	$\frac{30}{17} = 1\frac{13}{17}$
30	$\frac{2}{17}(30)$	$\frac{60}{17} = 3\frac{9}{17}$
45		
60		

$$\begin{aligned}
 \text{speed} &= \frac{\text{distance}}{\text{time}} \\
 &= \frac{4 \text{ mi}}{34 \text{ min}} \\
 &= \frac{2}{17} \\
 &= \frac{1}{8.5}
 \end{aligned}$$

Mar 7-11:50 AM

Exercises

1. Find five solutions for the linear equation $x + y = 3$, and plot the solutions as points on a coordinate plane.

Linear equation:		y
x	$x + y = 3$	
0	$0 + y = 3$	3
1	$1 + y = 3$	2
2	$2 + y = 3$	1
3	$3 + y = 3$	0
4	$4 + y = 3$	-1

Mar 7-11:26 AM

2. Find five solutions for the linear equation $2x - y = 10$, and plot the solutions as points on a coordinate plane.

Linear equation:		y
x	$2x - y = 10$	
0	$2(0) - y = 10$ $\cancel{2}\cancel{y} = \frac{10}{-1}$	-10
1	$2(1) - y = 10$ $\cancel{2}\cancel{y} = \frac{10}{-1}$	-8
2	$2(2) - y = 10$ $\cancel{2}\cancel{y} = \frac{10}{-1}$	-6
3		-4
4		-2

linear
not prop.

(6, -10)
(1, -8)
(2, -6)
(3, -4)
(4, -2)

Mar 7-11:26 AM

1. Find five solutions for the linear equation $x + 5y = 21$, and plot the solutions as points on a coordinate plane.

x	Linear equation: $x + 5y = 21$	y
21	$x + 5(0) = 21$ $x + 0 = 21$	0
16	$x + 5(1) = 21$ $x + \cancel{5} = 21$ $x = 21 - 5$ $x = 16$	1
11	$x + 5(2) = 21$ $x + 10 = 21$ $x = 21 - 10$ $x = 11$	2
6		3
1		4

$$\begin{aligned}x + 5x &= 21 \\ 6x &= 21 \\ x &= \frac{21}{6} \\ x &= 3.5\end{aligned}$$

$$\begin{aligned}2 + 5y &= 21 \\ 5y &= 19 \\ y &= \frac{19}{5} \\ y &= 3.8\end{aligned}$$

Mar 7-11:27 AM

4. Consider the linear equation $\frac{2}{5}x + y = 11$.

- a. Will you choose to fix values for x or y ? Explain:

x because $\frac{2}{5}$ is the coefficient on the x

- b. Are there specific numbers that would make your computational work easier? Explain.

$\frac{2}{5}(x)$
multiples of 5
5, 10, 15, ...

2 + $y = 11$
 $y = 9$

Mar 7-11:27 AM

$$\frac{2}{5}x + y = 11$$

$$\frac{2}{5}x + \cancel{y} = \underline{11} - \underline{\cancel{3}}$$

$$\cancel{(\frac{2}{5})x} = 48 \cancel{(\frac{5}{2})}$$

$$x = 20$$

Mar 7-12:09 PM

c. Find five solutions to the linear equation $\frac{2}{5}x + y = 11$, and plot the solutions as points on a coordinate plane.

Linear equation: $\frac{2}{5}x + y = 11$

x	$\frac{2}{5}x + y = 11$	y
0	$\frac{2}{5}(0) + y = 11$	11
5	$\frac{2}{5}(5) + y = 11$	9
10	$\frac{2}{5}(10) + y = 11$	7
15	$\frac{2}{5}(15) + y = 11$	5
20	$\frac{2}{5}(20) + y = 11$	3

$y = -\frac{2}{5}x + 11$

Mar 7-11:27 AM

5. At the store you see that you can buy a bag of candy for \$2 and a drink for \$1. Assume you have a total of \$35 to spend. You are feeling generous and want to buy some snacks for you and your friends.

a. Write an equation in standard form to represent the number of bags of candy, x , and the number of drinks, y , you can buy with \$35.

$$2x + 1y = 35 - 2x$$

b. Find five solutions to the linear equation, and plot the solutions as points on a coordinate plane.

x	Linear equation: $2x + y = 35$	y
0	$2(0) + y = 35$	35
1	$2(1) + y = 35$	33
2	$2(2) + y = 35$	31
3	$2(3) + y = 35$	29
$\frac{5}{2}$	$2\left(\frac{5}{2}\right) + y = 35$	27

$y = -2x + 35$

Mar 7-11:28 AM

Problem Set

1. Consider the linear equation $x - \frac{3}{2}y = -2$.
- Will you choose to fix values for x or y ? Explain.
 - Are there specific numbers that would make your computational work easier? Explain.
 - Find five solutions to the linear equation $x - \frac{3}{2}y = -2$ and plot the solutions as points on a coordinate plane.

x	Linear equation: $x - \frac{3}{2}y = -2$	y
		0
		2
		4
		6
		8

Mar 7-11:28 AM

- 8
2. Find five solutions for the linear equation $\frac{1}{3}x + y = 12$, and plot the solutions as points on a coordinate plane.
 3. Find five solutions for the linear equation $-x + \frac{3}{4}y = -6$, and plot the solutions as points on a coordinate plane.
 4. Find five solutions for the linear equation $2x + y = 5$, and plot the solutions as points on a coordinate plane.
 5. Find five solutions for the linear equation $3x - 5y = 15$, and plot the solutions as points on a coordinate plane.

Mar 7-11:28 AM

Hunk page ~~15~~ → do not graph
 Using the tables, find 5 solutions for each.

#2

X	$\frac{1}{3}x + y = 12$	Y
0		
3		
6		
9		
12		

#3

X	$-x + \frac{3}{4}y = -6$	Y
		0
		4
		8
		12
		16

Mar 7-11:29 AM

#4			#5		
x	$2x+y=5$	y	x	$3x-5y=15$	y
0			0		
1			1		
2			2		
3			3		
4			4		

Mar 7-11:29 AM

5. At the store you see that you can buy a bag of candy for \$6 and a bag of chips for \$3. You have \$35 to spend. You are feeling generous and want to buy some snacks for you and your friends.
- a. Write an equation in standard form to represent the number of bags of candy, x , and the number of bags of chips, y , you can buy with \$35.

- b. Find five solutions to the linear equation, and plot the solutions as points on a coordinate plane.

x	Linear equation:	y

Mar 7-11:28 AM

NOT TO BE PROPORTIONAL*

Dylan makes \$336 for 32 hours of work, and Angela makes \$420 for 42 hours of work.

1) How much do Dylan and Angela each make per hour?

Dylan $\$10.50$ Angela $\$10/\text{hr.}$

2) Is Dylan's wage for 25 hours proportional to Amber's wage for 12 hours? Why or why not?

NO - Dylan

~~$\frac{336}{32} = \frac{42}{42}$~~

To determine proportionality between two ratios or rates,

$336 \times 42 = 32 \times 420$

Mar 6-11:27 AM

Table 1:		$m = y/x$
X	Y	
NUMBER OF HOURS	TOTAL COST (\$)	RATIO
1	\$75	$\frac{75}{1} = 75$
2	\$120	$\frac{120}{2} = 60$
3	\$165	
4	\$210	
5	\$255	

Table 2:		$m = y/x$
X	Y	
NUMBER OF HOURS	TOTAL COST (\$)	RATIO
1	\$45	$\frac{45}{1} = 45$
2	\$90	$\frac{90}{2} = 45$
3	\$135	$\frac{135}{3} = 45$
4	\$180	$\frac{180}{4} = 45$
5	\$225	$\frac{225}{5} = 45$

3] Which table shows a proportional relationship?

4] What makes it a proportional relationship?

Table 2
Constant Ratio

Mar 6-11:28 AM

LESSON 11: Constant Rate

Classwork

Example 1

Pauline mows a lawn at a constant rate. Suppose she mows a 35 square foot lawn in 2.5 minutes. What area, in square feet, can she mow in 10 minutes? t minutes?

$$(A) \frac{35 \text{ ft}^2}{2.5 \text{ min}} = 14 \frac{\text{ft}^2}{\text{min}} \text{ unit rate}$$

$$14 \frac{\text{ft}^2}{\text{min}} \times 10 \text{ min} = 140 \text{ ft}^2$$

$$y = 14x$$

~~$$(B) \frac{35}{2.5} = \frac{x}{10}$$~~

$$(35)(10) = 2.5x$$

$$\frac{350}{2.5} = \frac{2.5x}{2.5}$$

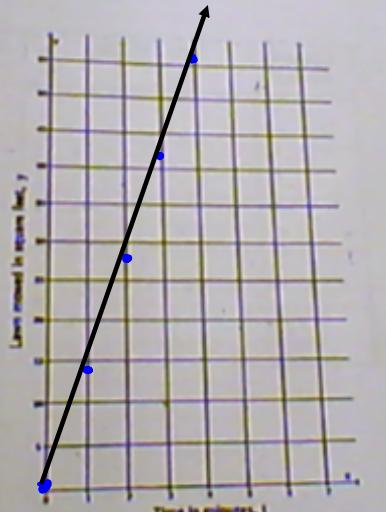
$$140 \text{ ft}^2 = x$$

min	area
2.5	35
10	?
	140

$$\text{Part B} = 14t \quad y = 14t$$

Mar 6-11:27 AM

X (time in minutes)	Linear equation:	y (area in square feet)
0	$y = \frac{35}{2.5}(0)$	0
1	$y = 14(1)$	14
2	$y = 14(2)$	28
3	$y = 14(3)$	42
4	$y = 14(4)$	56
10	$y = 14(10)$	140



Mar 6-11:27 AM

Example 2

Water flows at a constant rate out of a faucet. Suppose the volume of water that comes out in three minutes is 10.5 gallons. How many gallons of water comes out of the faucet in t minutes?

$$y = kx$$

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

Unit Rate

$$y = 3.5x$$

$$y = 3.5t$$

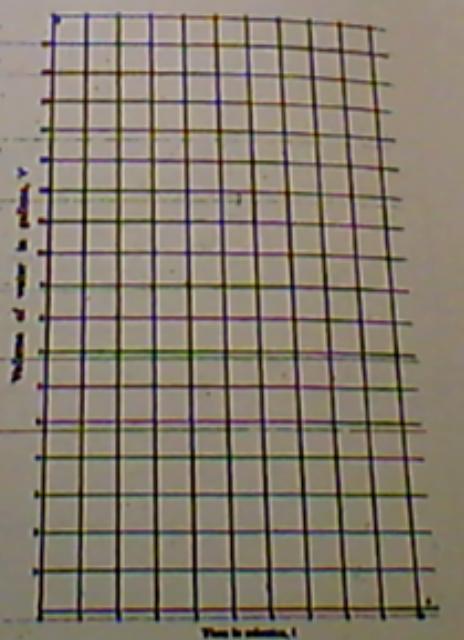
gallons per minute

$$10.5 \text{ gal} \div 3 \text{ min}$$

$$3.5 \text{ gal/min}$$

Mar 6-11:28 AM

t (time in minutes)	Linear equation: $y = 3.5t$ $y = 3.5(0)$	V (in gallons)
0		
1		
2		
3		
4		



Mar 6-11:28 AM

Exercises

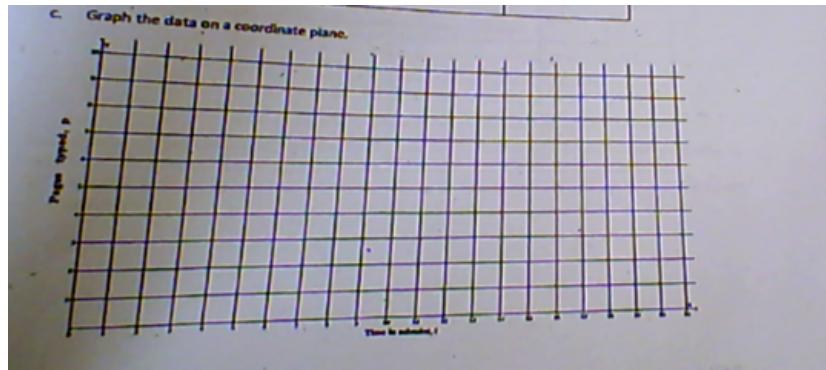
1. Jesus types at a constant rate. He can type a full page of text in $3\frac{1}{2}$ minutes. We want to know how many pages, p , Jesus can type after t minutes.
- a. Write the linear equation in two variables that represents the number of pages Jesus types in any given time interval.

Mar 6-11:29 AM

- b. Complete the table below. Use a calculator and round answers to the tenths place.

t (time in minutes)	Linear equation:	p (pages typed)
0	$y =$	
5		
10		
15		
20		

Mar 6-11:29 AM



Mar 6-11:29 AM

d. About how long would it take Amos to type a 5-page paper? Explain.

Mar 6-11:29 AM

2. Emily paints at a constant rate. She can paint 32 square feet in five minutes. What area, A , can she paint in t minutes?

4. Write the linear equation in two variables that represents the number of square feet Emily can paint in any given time interval.

b. Complete the table below. Use a calculator and round answers to the tenths place.

t (time in minutes)	Linear equation:	A (area painted in square feet)
0	$y =$	
1		
2		
3		
4		

Mar 6-11:30 AM