



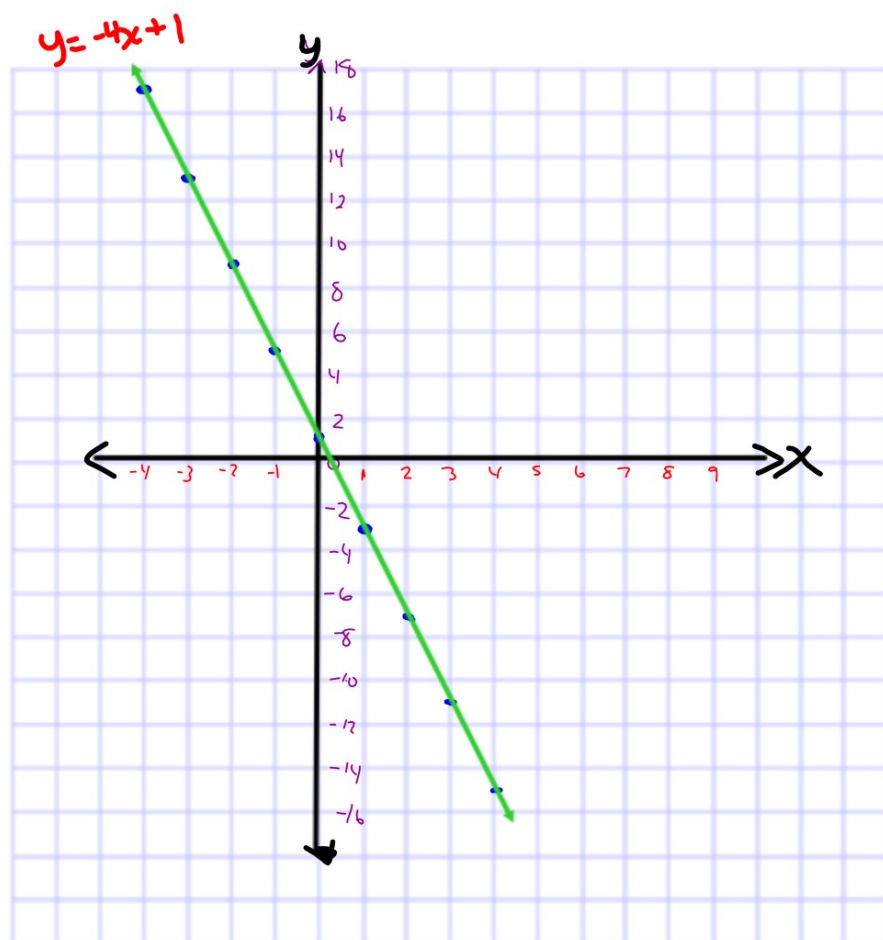
Warm Up Grade 8
Date:



The equation of a linear relation is: $y = -4x + 1$

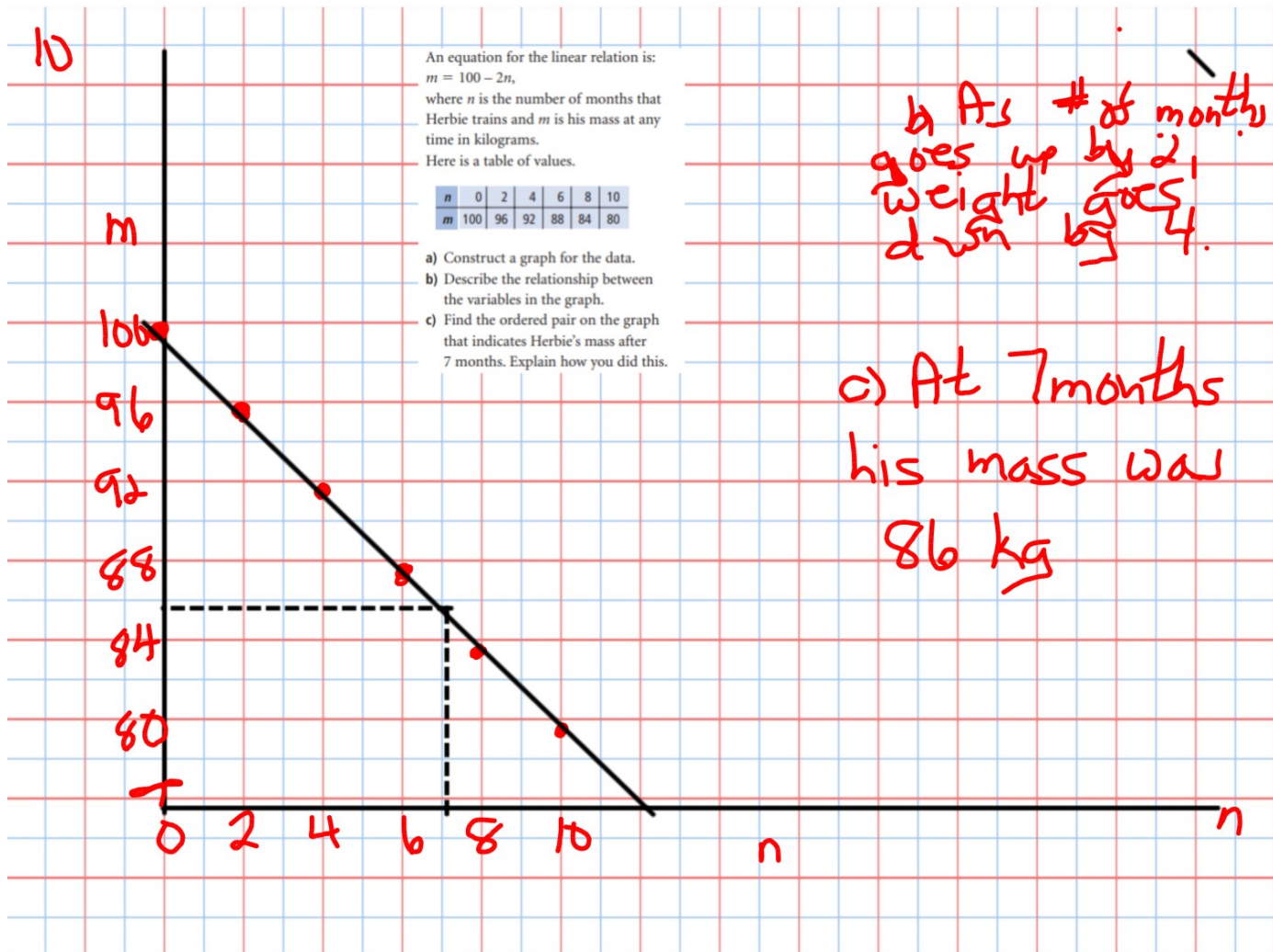
- Create a table of values for the relation for integer values of x from -4 to 4.
- Graph the relation.
- Describe the relationship between the variables in the graph.

x	y			
-4	17	$x = -4$	$x = -3$	$x = -2$
-3	13	$y = -4x + 1$	$y = -4x + 1$	$y = -4x + 1$
-2	9	$y = -4(-4) + 1$	$y = -4(-3) + 1$	$y = -4(-2) + 1$
-1	5	$y = 16 + 1$	$y = 12 + 1$	$y = 8 + 1$
0	1	$y = 17$	$y = 13$	$y = 9$
1	-3			
2	-7			
3	-11			
4	-15			



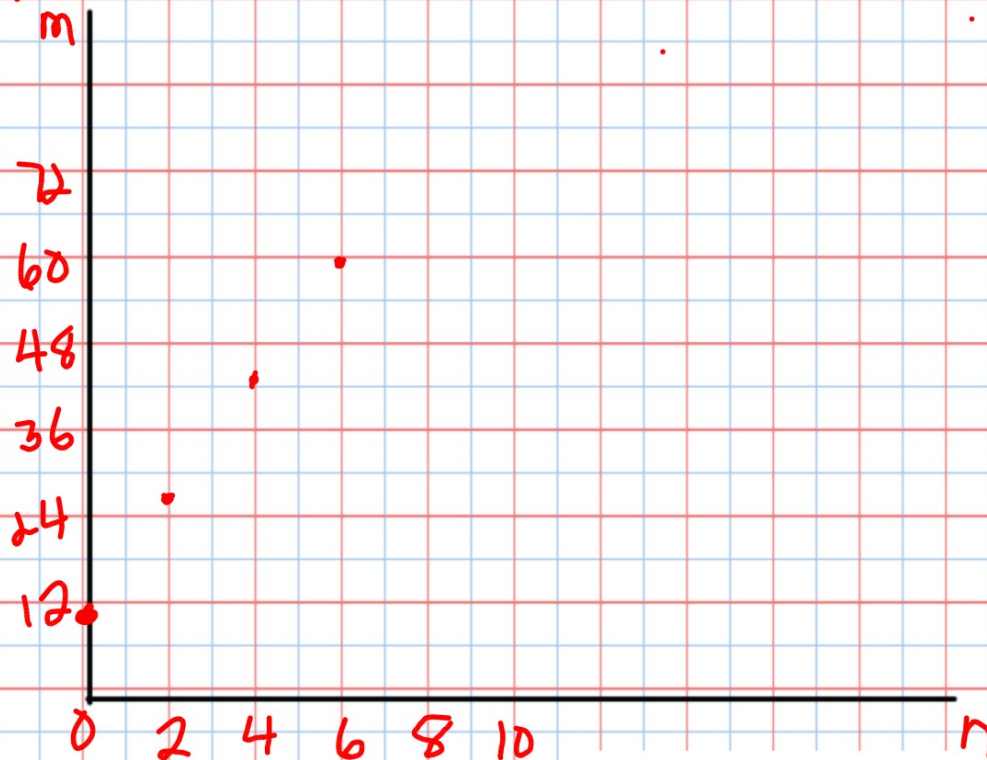
x	y
-4	17
-3	13
-2	9
-1	5
0	1
1	-3
2	-7
3	-11
4	-15





$$11 \quad m = 8n + 12$$

n	m
0	12
2	28
4	44
6	60



b) As # of people go up by 1,

of marshmallows go up by 8

d) Yes, it linear, the dots form a straight line

11. Assessment Focus Regina plans a marshmallow roast. She will buy 8 marshmallows for each person who attends, and 12 extra marshmallows in case someone shows up unexpectedly. Let n represent the number of people who attend. Let m represent the number of marshmallows Regina must buy. An equation that relates the number of marshmallows to the number of people is: $m = 8n + 12$

- Create a table of values for the relation.
- Graph the relation.
- Describe the relationship between the variables in the graph.
- Is the relation linear? How do you know?

a)

$$n = 0$$

$$m = 8(0) + 12$$

$$0 + 12$$

$$12$$

a)

$$n = 2$$

$$m = 8(2) + 12$$

$$16 + 12$$

$$28$$

a)

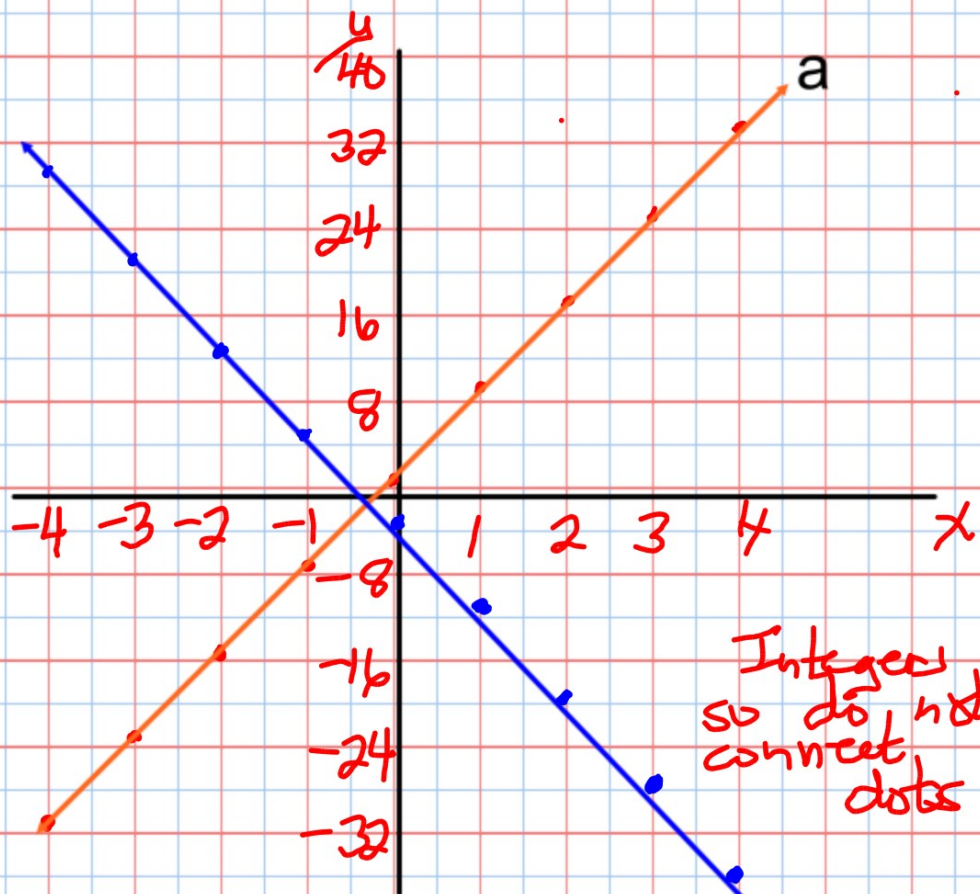
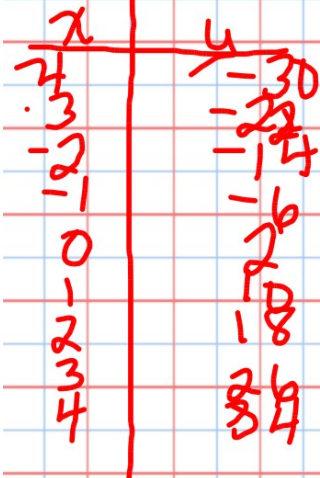
$$n = 4$$

$$m = 8(4) + 12$$

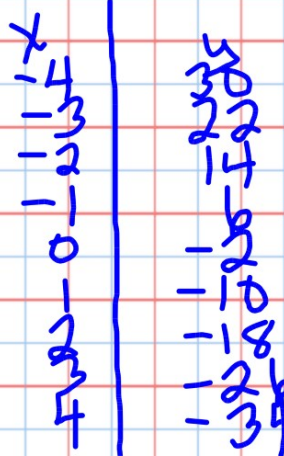
$$32 + 12$$

$$44$$

12a) $y = 8x + 2$



b) $y = -8x - 2$



12. Graph each relation for integer values of x from -4 to 4 .

- a) $y = 8x + 2$ b) $y = -8x - 2$
 c) $y = -7x + 4$ d) $y = 5x - 4$

a)

$$x = -4$$

$$y = 8(-4) + 2$$

$$-32 + 2$$

$$-30$$

a)

$$x = -3$$

$$y = 8(-3) + 2$$

$$-24 + 2$$

$$-22$$

a)

$$x = -2$$

$$y = 8(-2) + 2$$

$$-16 + 2$$

$$-14$$

b)

$$x = -4$$

$$y = -8(-4) - 2$$

$$32 - 2$$

$$30$$

b)

$$x = -3$$

$$y = -8(-3) - 2$$

$$24 - 2$$

$$22$$

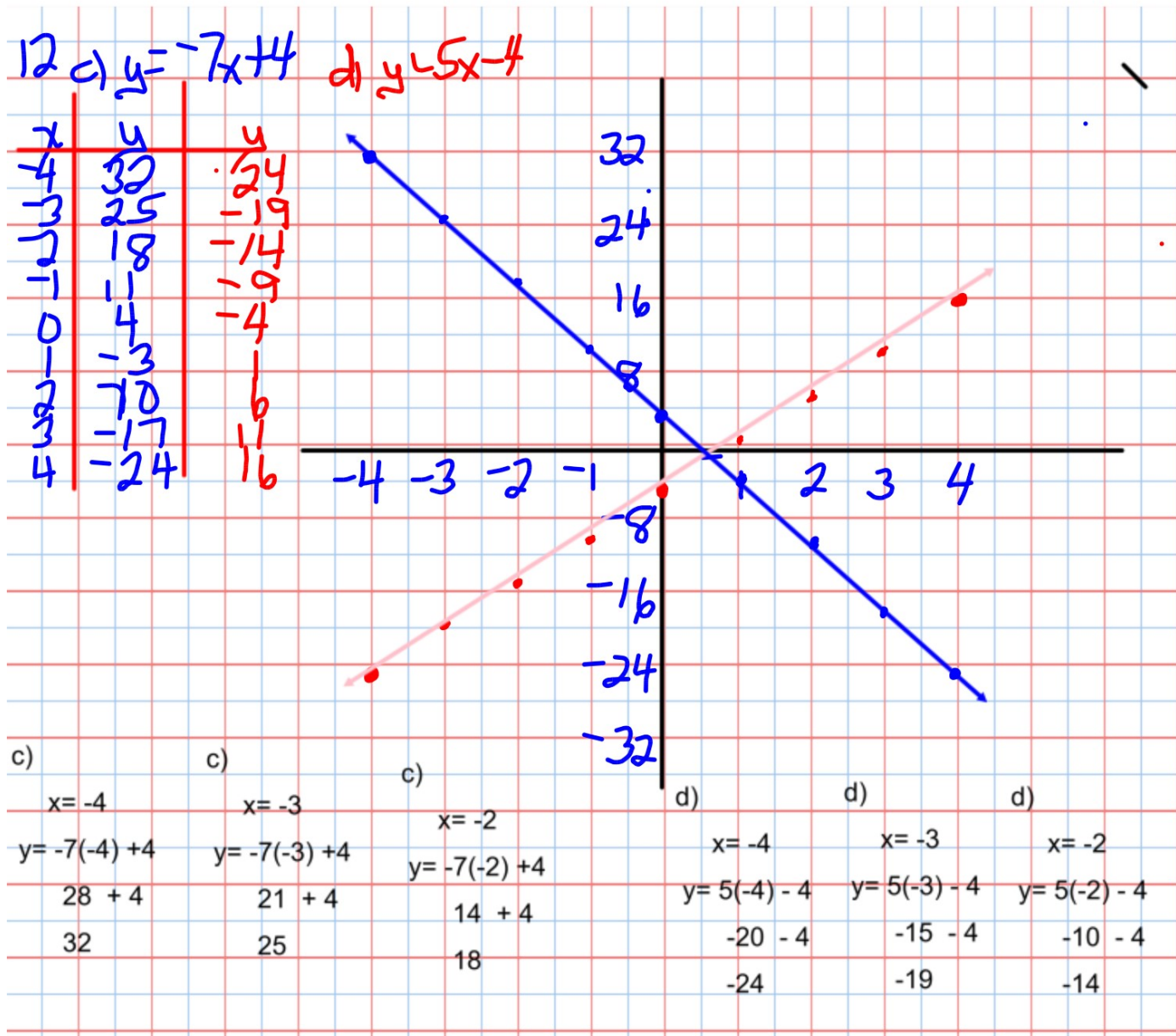
b)

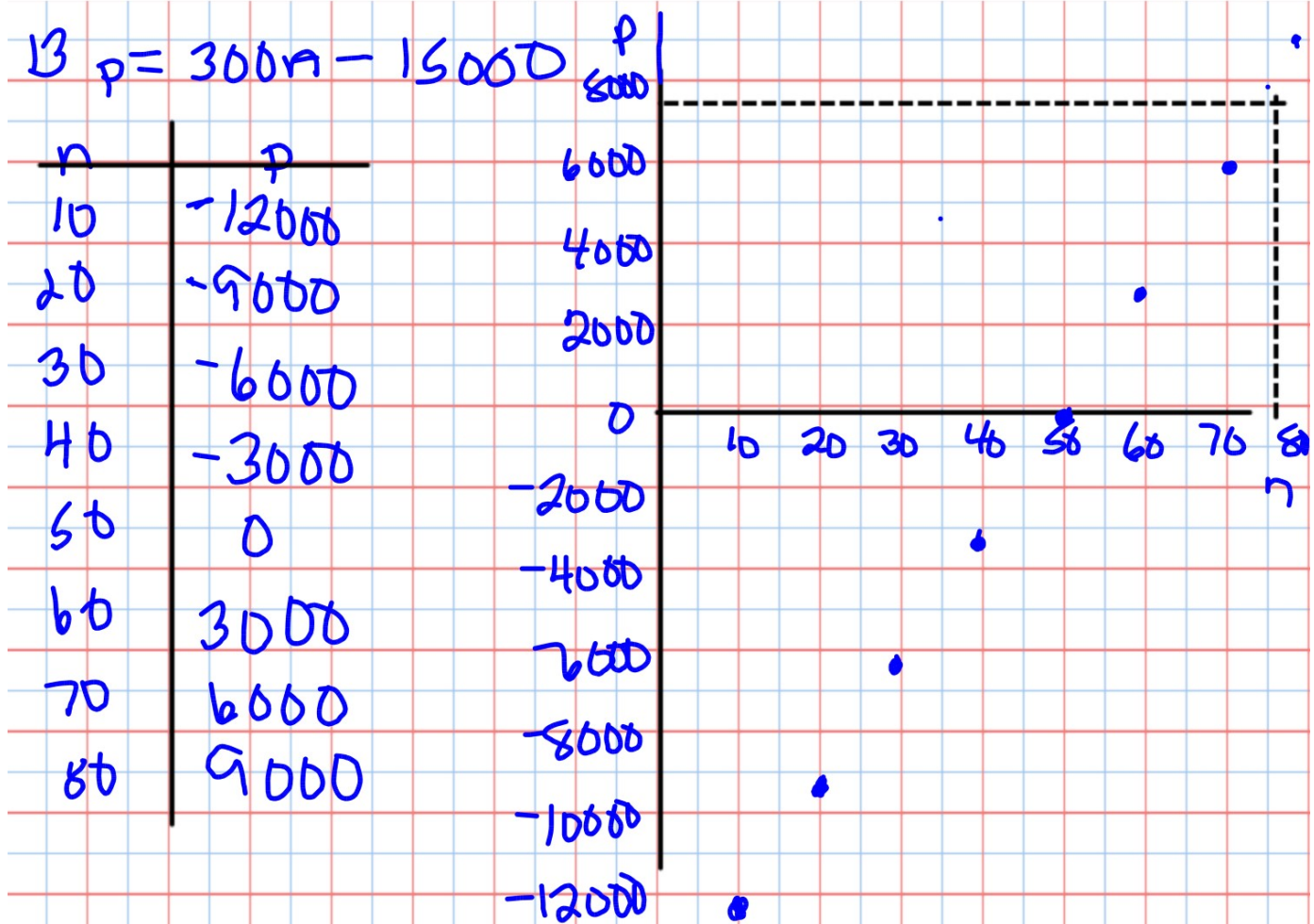
$$x = -2$$

$$y = -8(-2) - 2$$

$$16 - 2$$

$$14$$





b) - values for p represent money loss

c) As # of tickets goes up by 10,
the profit goes up by 3000.

a)

$$n = 10$$

$$p = 300(10) - 15000$$

$$3000 - 15000$$

$$-12000$$

a)

$$n = 20$$

$$p = 300(20) - 15000$$

$$6000 - 15000$$

$$-9000$$

a)

$$n = 40$$

$$p = 300(40) - 15000$$

$$12000 - 15000$$

$$-3000$$

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18. The equation of a linear relation is:

$$y = -7x + 4$$

Find the missing number in each ordered pair.

a) $(-2, \quad)$

b) $(\quad, -17)$

$$\begin{aligned} y &= -7x + 4 \\ &= -7(-2) + 4 \\ &= 14 + 4 \\ &= 18 \\ (-2, 18) \end{aligned}$$

$$\begin{aligned} -17 &= -7x + 4 \\ -17 - 4 &= -7x + 4 - 4 \\ -21 &= -7x \\ \div -7 &\div -7 \\ 3 &= x \\ (3, -17) \end{aligned}$$

c) $(8, \quad)$

d) $(\quad, 4)$

$$\begin{aligned} y &= -7x + 4 \\ &= -7(8) + 4 \\ &= -56 + 4 \\ &= -52 \\ (8, -52) \end{aligned}$$

$$\begin{aligned} y &= -7x + 4 \\ 4 &= -7x + 4 \\ 4 - 4 &= -7x + 4 - 4 \\ 0 &= -7x \\ \div -7 &\div -7 \\ 0 &= x \\ (0, 4) \end{aligned}$$

19)

19. Francis sells memberships to a local health club. He is paid \$200 per week, plus \$40 for each membership he sells. An equation for this relation is $p = 200 + 40n$, where n represents the number of memberships Francis sells, and p represents his pay in dollars.

a) Use the equation to create a table of values.

$$\begin{aligned} n=0 & \quad p=200+40(0) \\ & \quad 200+0 \\ & \quad 200 \end{aligned} \quad \begin{aligned} n=1 & \quad p=200+40(1) \\ & \quad =200+40 \\ & \quad =240 \end{aligned}$$

$$\begin{aligned} n=3 & \quad p=200+40(3) \\ & \quad =200+120 \\ & \quad =320 \end{aligned}$$

b) One week, Francis sold 9 memberships. What was his pay for that week?

$$\begin{aligned} n &= 9 \\ p &= 200 + 40(n) \\ &= 200 + 360 \\ &= 560 \end{aligned}$$

Francis' pay for 9 memberships is \$560.

c) One week, Francis was paid \$480.

How many memberships did he sell that week?

$$480 = 200 + 40n$$

$$\begin{aligned} 280 &= 40n \\ \div 40 &\div 40 \end{aligned}$$

$$7 = n$$

Francis

Graph $p = 200 + 40n$

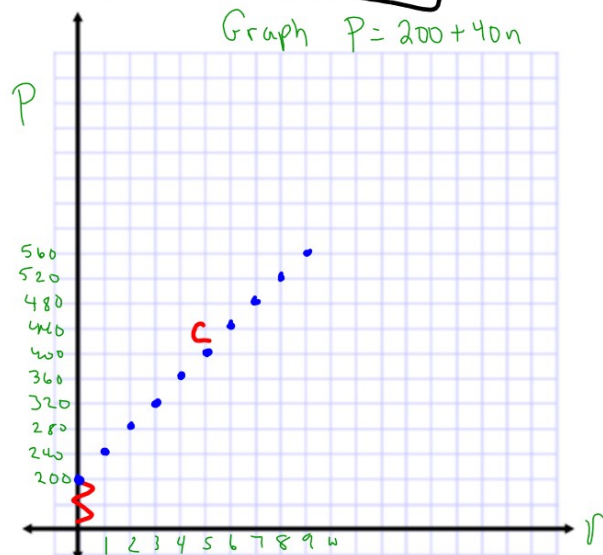
20)

20. Use the data from question 19.

- Construct a graph for the data.
- Describe the relationship between the variables in the graph.
- Find the ordered pair on the graph that shows Francis' pay when he sells 5 memberships.

b) As n increases by 1, p increases by 40

c) $(5, 400)$

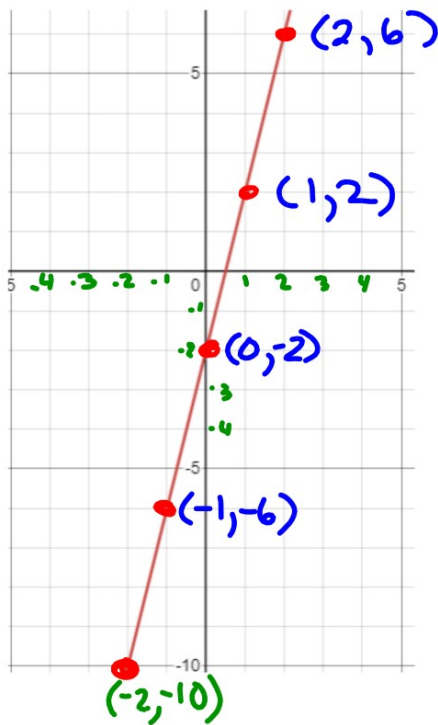


The graph below is a graph of a linear relation.

Describe the relationship between the variables in each graph

(Hint: Do a table of values)

$$y = 4x - 2$$



x	y
-2	-10
-1	-6
0	-2
1	2
2	6

Handwritten annotations: A bracket on the left side of the x-values from -2 to -1 is labeled "up 1". A bracket on the right side of the y-values from -10 to -6 is labeled "up 4".

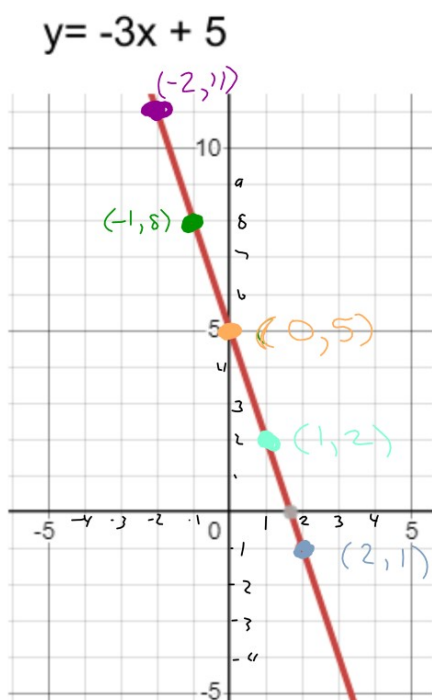
As x increases by 1, y increases by 4.

The graph below is a graph of a linear relation.

You try

Describe the relationship between the variables in each graph

(Hint: Do a table of values)



4p1

x	y
-2	11
-1	8
0	5
1	2
2	-1

down 3

As x increases by 1, y decreases by 3.



The cost of renting a kayak is \$8 plus \$4 per hour. An equation for this relation is $C = 8 + 4h$, where h represents the number of hours the kayak is rented, and C represents the total cost.

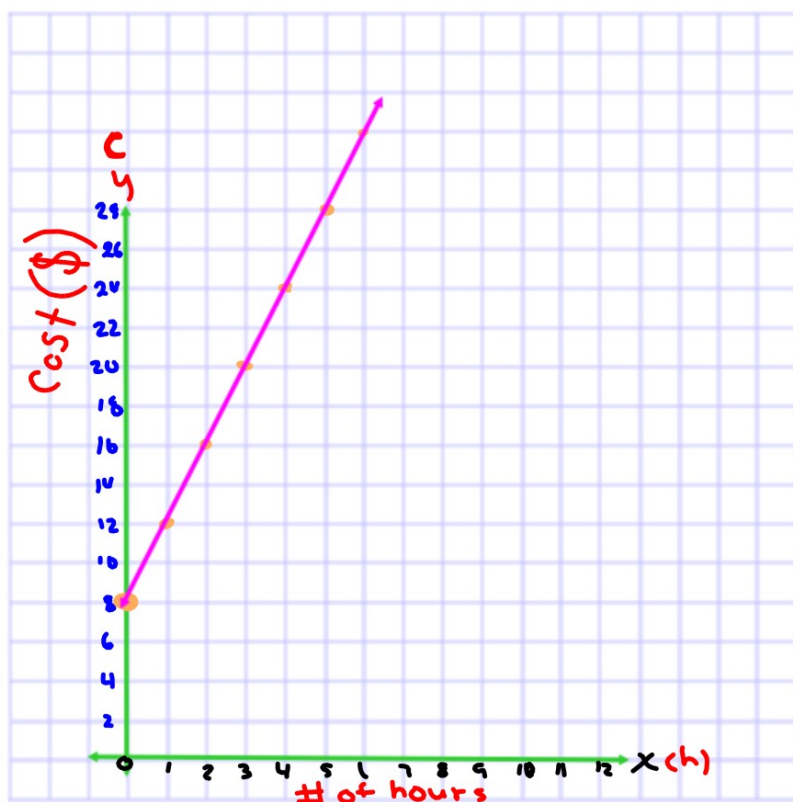
$$C = 8 + 4h$$

$$y = 8 + 4x$$

- a) Make a table of values for the relation.
b) Graph the relation.
c) Describe the relationship between the variables in the graph.



Kayak Rentals



h	C
0	8
1	12
2	16
3	20
4	24
5	28

Connect dots
b/c I can
rent a kayak
for 2.5 hrs.

$$\begin{array}{l} x = 0 \\ y = 8 + 4x \\ y = 8 + 4(0) \\ y = 8 + 0 \\ y = 8 \end{array} \quad \left. \begin{array}{l} x = 1 \\ y = 8 + 4x \\ y = 8 + 4(1) \\ y = 8 + 4 \\ y = 12 \end{array} \right\} \quad \begin{array}{l} x = 2 \\ y = 8 + 4x \\ y = 8 + 4(2) \\ y = 8 + 8 \\ y = 16 \end{array}$$

As #hours increases by 1, the cost increases by \$4.

Given $Y = 2x + 5$ find the missing term below

(x, y)

a) $(\underline{x}, y)$
 $(-2, \underline{\quad})$

given $x = -2$
 Find y

$$y = 2x + 5$$

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

$$y = -4 + 5$$

$$y = 1$$

$$(-2, 1)$$

b) $(\underline{\quad}, 19)$

Given $y = 19$
 find x

$$y = 2x + 5$$

↓

$$19 = 2x + 5$$

$$\underbrace{19}_{-5} = 2x + \cancel{5}$$

$$\underbrace{14}_{\div 2} = \underbrace{2x}_{\div 2}$$

$$\boxed{7 = x}$$

$$(\underline{7}, 19)$$

Use $y = 5x - 4$ to find the missing term in the ordered pair.

(Show work)

a) $(7, \underline{\quad})$

b) $(-2, \underline{\quad})$

c) $(\underline{\quad}, 51)$