

LESSON 2 PRACTICE PROBLEMS KEY

1) f $\frac{3}{4}x - 11 = 1$, then $x =$

d) 16

$$\begin{aligned}\frac{3}{4}x - 11 &= 1 \\ \frac{3}{4}x &= 12 \\ \frac{4}{3}\left(\frac{3}{4}x\right) &= \frac{4}{3}(12) \\ x &= \mathbf{16}\end{aligned}$$

2) If $7x + 6y = 15$ and $4x - 6y = 18$, what is the value of x ?

a) 3

Line the equations up vertically:

$$7x + 6y = 15$$

$$\underline{4x - 6y = 18} \quad \text{Add the equations together.}$$

$$11x = 33$$

$$x = \mathbf{3}$$

3) Solve for x : $8x + 11 \geq 15$

c) $x \geq \frac{1}{2}$

$$8x + 11 \geq 15$$

$$8x \geq 4$$

$$x \geq \frac{4}{8}$$

$$x \geq \frac{1}{2}$$

4) If $10m - 50 + 20p = 0$, what is the value of $m + 2p$?

b) 5

$$10m - 50 + 20p = 0$$

$$10m + 20p = 50 \quad \text{divide both sides by 10}$$

$$m + 2p = \mathbf{5}$$

5) Which of the following means $5n + 7 = 17$?

a) 7 more than 5 times a number is 17

6) Solve for x in the following equation: $\frac{1}{3}x + 3 = 8$.

b) 15

$$\begin{aligned}\frac{1}{3}x + 3 &= 8 \\ \frac{1}{3}x &= 5 \\ 3\left(\frac{1}{3}x\right) &= 3(5) \\ x &= 15\end{aligned}$$

7) If $\frac{a}{b} = \frac{3}{4}$ then $8a =$

a) 6b

$$\begin{aligned}\frac{a}{b} &= \frac{3}{4} \text{ cross-multiply} \\ 4a &= 3b \text{ multiply both sides by 2 to get } 8a \\ 8a &= 6b\end{aligned}$$

8) Solve the following inequality for x: $-5x + 7 < 22$

c) $x > -3$

$$-5x + 7 < 22$$

$$-5x < 15$$

$$\frac{-5x}{-5} > \frac{15}{-5}$$

$$x > -3$$

Remember, we have to reverse the symbol when dividing both sides by a negative!

9) Sarah solves the following equation correctly:

$$6(x - 8) = 2x + 4(x - 11)$$

$$6x - 48 = 2x + 4x - 44$$

$$6x - 48 = 6x - 44$$

$$\begin{array}{r} -6x \quad -6x \\ \hline -48 = -44 \end{array}$$

Which of the following is the solution to the equation?

d) There is no solution

When the letter "drops out" of the equation and the remaining statement is FALSE, then there is NO SOLUTION.

- 10) Solve the inequality for x. Choose all that apply.
 $8x + 3 > 102$

$$8x + 3 > 102$$

$$8x > 99$$

$$x > 12.375$$

- c) 12.4 d) 13 e) 13.5

- 11) If $x = \frac{y^2}{2} + y + 1$, what is the value of x when y is -8?

d) 25

$$x = \frac{y^2}{2} + y + 1$$

$$x = \frac{(-8)^2}{2} + (-8) + 1$$

$$x = \frac{64}{2} - 8 + 1$$

$$x = 32 - 8 + 1$$

$$x = 25$$

- 12) Which graph represents the equation: $4x + 2y = 8$?

Let $x = 0$

$$2y = 8$$

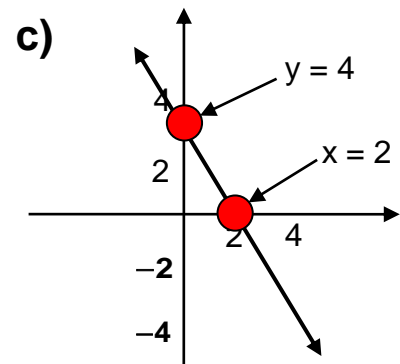
$$y = 4$$

Let $y = 0$

$$4x = 8$$

$$x = 2$$

x	y
0	4
2	0



- 13) A salesperson makes \$55/day plus \$20 for each lawn mower she sells. If she made \$275 today, how many lawn mowers did she sell?

a) 11

Let $L = \#$ of lawn mowers

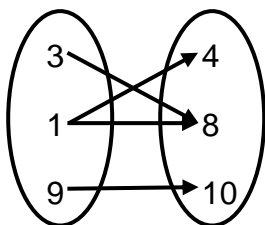
$$55 + 20L = 275$$

$$20L = 220$$

$$L = 11$$

- 14) Which of the following does not represent a function?

d)



This represents the pairs:

$(3, 8)$ $(1, 4)$ $(1, 8)$, $(9, 10)$.

In order to be a function, the x value can NOT be repeated so choice d is not a function.

- 15) What is the first step in solving the equation: $-5x + 4 = 28$?

c) Subtract 4 from both sides

When solving an equation we always do addition or subtraction first. To remove the $+ 4$, we must subtract 4 from both sides first.

16) Solve for x: $-6x + 3 > 33$

d) $x < -5$

$$-6x + 3 > 33$$

$$-6x > 30$$

$$\frac{-6x}{-6} > \frac{30}{-6}$$

$$x < -5$$

Remember, if we divide both sides of an inequality by a negative number, we must reverse the symbol!

17) A man makes \$14/hour for working a 40 hour week. He makes \$18/hour for each hour of overtime. Which shows the correct equation for the money he will make by working 40 hours and x hours of overtime?

b) $14(40) + 18(x)$

**\$14/hour for 40 hours = $14(40)$
\$18/hour for x hours overtime = $18(x)$.
Then add the two amounts together:
 $14(40) + 18(x)$**

18) A number, n, is squared. Then 9 is added to the result. Then the result is divided by 3. If the final result is 246, what is the value of n?

$$\frac{n^2 + 9}{3} = 246$$

$$n^2 + 9 = 738$$

$$n^2 = 729$$

$$n = \sqrt{729}$$

$$n = 27$$

27

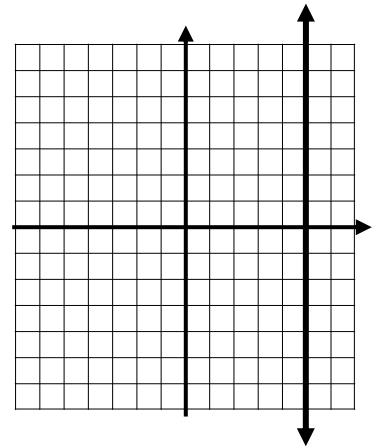
19) Which of the following expressions is equivalent to the expression $23 - 8x$ for all values of x ?

b) $5 - 2(4x - 9)$

$$\begin{aligned} & 5 - 2(4x - 9) \\ &= 5 - 8x + 18 \\ &= 23 - 8x \end{aligned}$$

20) What is the equation of the line shown on the graph?

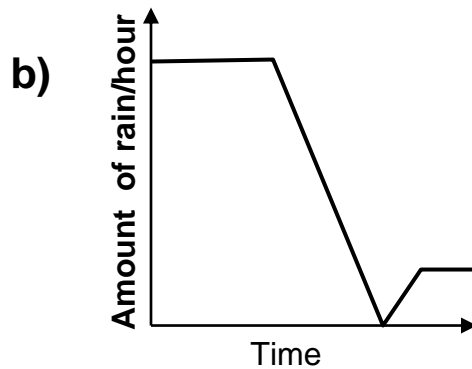
e) $x = 5$



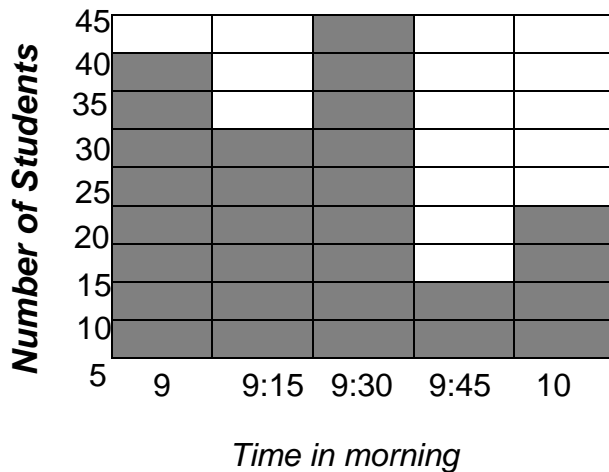
This is a vertical line and it hits the x-axis at 5, so the equation is $x = 5$.

**Another way of looking at it:
If you pick a few points on the line you will see the pattern: $(5,0)$ $(5,1)$ $(5,2)$ $(5,3)$
They all have the same x-value = 5,
so the equation of the line is: $x = 5$.**

- 21) Which of the graphs below shows the following scenario:
It rained very hard for several hours, then tapered off, then stopped completely and then drizzled for a few more hours.



- 22) The table shows how many students entered class at different times



How many students entered class after 9 a.m.?

b) 105

Notice it says AFTER 9 a.m.

30 at 9:15 a.m.

45 at 9:30 a.m.

10 at 9:45 a.m.

20 at 10:00 a.m.

Total = 30 + 45 + 10 + 20

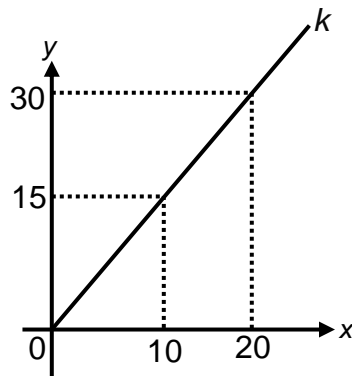
= 105

Yes, this is a statement about students coming late to class!

23) If $x - 7 = 8y + 1$, what is y in terms of x ?

b) $\frac{x - 8}{8}$

$x - 7 = 8y + 1$	Subtract 1 from both sides
$x - 8 = 8y$	Divide both sides by 8
$\frac{x - 8}{8} = y$	You can't cancel over a minus or plus sign!



X increases by 10 so you would have to move 2 more on the x axis.

This means you would have to move 2 up on the y-axis. Y increases by 15 so...
 $30 + 15 + 15 = 60$

24) The graph of line k is shown in the xy -plane above. The point on line k that has x -coordinate 40 is not shown. What is the y -coordinate of that point?

e) 60

25) Which of the following is equivalent to $72k + 108j$?

a) $9(8k + 12j)$

$9(8k + 12j) = 72k + 108j$

26) If $h + g = 53$ and $m + n = 112$, what is the value of $(5h + 5g)(2m + 2n)$?

b) 59360

$5h + 5g = 5(53) = 265$

$2m + 2n = 2(112) = 224$

$(5h + 5g)(2m + 2n) = 265(224) = 59360$

27) Solve for p : $\sqrt{p-91.3} + 21 = 108$

7660.3

$$\sqrt{p-91.3} + 21 = 108$$

$$\sqrt{p-91.3} = 87$$

$$(\sqrt{p-91.3})^2 = (87)^2$$

$$p-91.3 = 7569$$

$$p = \mathbf{7660.3}$$

28) If $9x - 206y = 87$, find x in terms of y.

d) $\frac{87 + 206y}{9}$

$9x - 206y = 87$ Solve for x.

$$9x = 87 + 206y$$

$$x = \frac{87 + 206y}{9}$$

29) If $x = \frac{1}{4}j$ and $j = \frac{2}{5}y$, what is the relationship

between x and y?

b) **$y = 10x$**

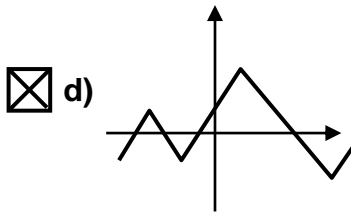
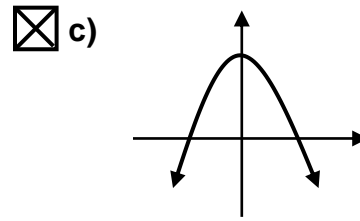
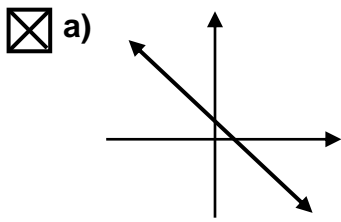
$$x = \frac{1}{4}j \text{ and } j = \frac{2}{5}y$$

Replace j with $\frac{2}{5}y$

$$x = \frac{1}{4}\left(\frac{2}{5}y\right)$$

$$x = \frac{1}{10}y \text{ or } \mathbf{y = 10x}$$

30) Which of the following represents a function? Choose all correct answers.



A vertical line will only hit each of these graphs one time so they are functions.

31) Which of the following **is** a function? Choose all correct answers.

b) $\{(-2,7)(-3,-4)(2,9)(5,-1)\}$

c) $\{(4,11)(6,-3)(0,9)(8,3)\}$

e) $\{(-7,0)(1,8)(4,1)(3,9)\}$

In each of these cases, the x-value is not repeated. Therefore they are functions.

32) Which of the following is equivalent to $18x^2$?

Choose all correct answers.

a) $10x^2 + 9x^2 - x^2 = 19x^2 - 1x^2 = 18x^2$

c) $(6x)(3x) = 18x^2$

d) $\frac{54x^3}{3x} = 18x^2$

33) $5(3x - 2) - 4(2x + 6) = 20$ Solve for x.

d) $\frac{54}{7}$

$5(3x - 2) - 4(2x + 6) = 20$ Solve for x.

$15x - 10 - 8x - 24 = 20$

$7x - 34 = 20$

$7x = 54$

$x = \frac{54}{7}$

34) Ashley sells advertising in a local magazine. She makes \$350 per week plus \$30 for every new full page ad she sells that week. If she wants to make at least \$750 this week so she can take a trip to Cancun, how many ads will she need to sell?

Let A = # of ads

"At least \$750" means \$750 or more: \geq

$350 + 30A \geq 750$

$30A = 400$

$A \geq 13.333$

14

35) Solve for x : $2(3x - 1) - 2(-5x + 1) = 10$. Express your answer as a fraction.

$$2(3x - 1) - 2(-5x + 1) = 10$$

$$6x - 2 + 10x - 2 = 10$$

$$16x - 4 = 10$$

$$16x = 14$$

$$x = \frac{14}{16} = \frac{7}{8}$$

7

8

36) The total cost, t , in dollars, for c children to attend a camp is estimated by the equation $t = 650c + 5,600$. If \$20,000 is available to pay for children to attend the camp, what is the greatest number of children that can attend the camp?

b) 22

$$t = 20,000$$

$$20,000 = 650c + 5600$$

$$14400 = 650c$$

$$c = 22.15$$

22 children

37) Teri has twice as many stamps as Jennifer. Brenda has 5 more stamps than Teri. If the total number of stamps is 195, how many stamps does **Brenda** have?

d) 81

Let J = # of stamps Jennifer has

Let $2J$ = # of stamps Teri has

Let $2J + 5$ = # of stamps Brenda has

$$J + 2J + 2J + 5 = 195$$

$$5J + 5 = 195$$

$$5J = 190$$

$$J = 38$$

Jennifer has 38 stamps but I hope you didn't pick "a" because they asked how many stamps Brenda has!!

$$\text{Brenda} = 2J + 5 = 2(38) + 5 = 81$$

38) A repairperson charges \$90/hour plus a service charge of \$150. If the bill came to \$960, which of the following will find the number of hours she worked?

a) $\frac{960 - 150}{90}$

Let h = # of hours worked
 $960 = 150 + 90h$
 $960 - 150 = 90h$
 $\frac{960 - 150}{90} = h$

x	f(x)
3	35
5	45
10	70
14	90
45	245

39) Which equation satisfies every entry in the above table?

c) $f(x) = 5x + 20$

Replace x with the numbers in the first column until you find an equation that “works”.

$5(3) + 20 = 35$

$5(5) + 20 = 45$

$5(10) + 20 = 70$ etc.....

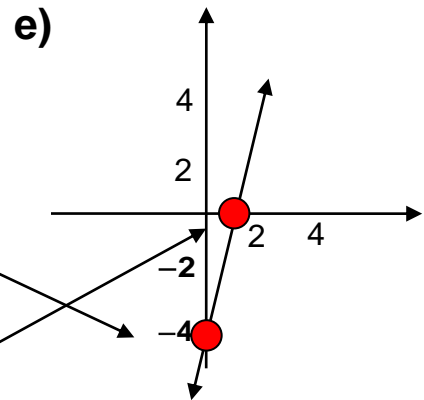
40) X is 7 times C , and C is 2 less than 4 times Y . Which of the following statements describes the relationship between X and Y ?

a) X is 14 less than 28 times Y .

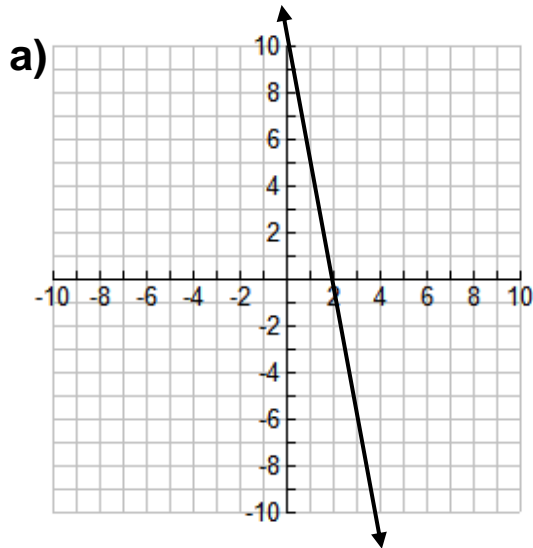
$X = 7C$ $C = 4Y - 2$ Replace C in first equation. $X = 7(4Y - 2)$ $X = 28Y - 14$ X is 14 less than 28 times Y .

41) Which graph represents the equation: $4x - y = 4$?

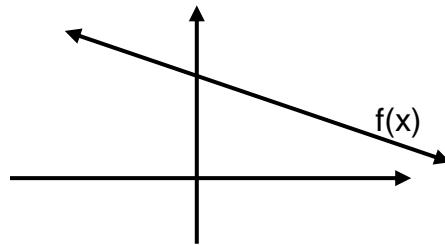
Let $x = 0$: $-y = 4$ $y = -4$ Let $y = 0$: $4x = 4$ $x = 1$



42) Which of the following graphs shows that as y decreases by 5, x increases by 1?



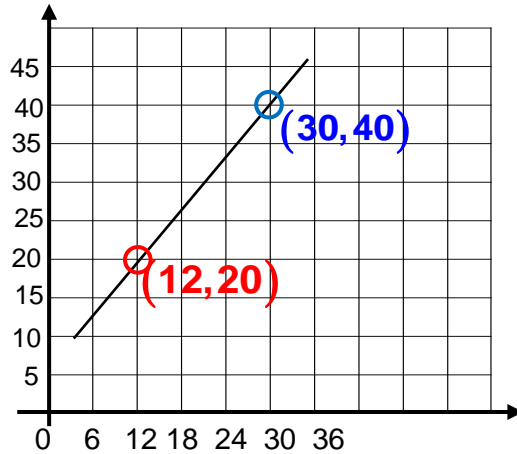
From the y -axis to the x axis you would go down 10 and right 2. This is equivalent to down 5 and right 1 or as y decreases by 5, x increases by 1.



43) Which of the following describes the graph of $f(x)$ shown above?

a) It is linear and as x increases, y decreases

Linear means line. This graph is a line therefore it is linear. As you go the right (x increases) the line goes down (y decreases).



44) The graph of a linear equation is shown above. Which of the following tables corresponds to the graph?

The points in table *d* match the points on the line.

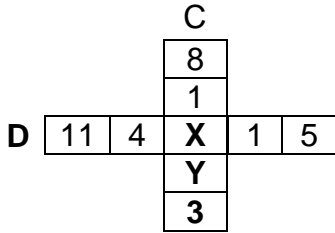
d)

x	y
12	20
18	26.7
30	40
36	46.7

45) $40 \left(\frac{3}{8}x + \frac{2}{5}x \right) = ?$

$$40 \left(\frac{3}{8}x + \frac{2}{5}x \right) = \frac{120}{8}x + \frac{80}{5}x = 15x + 16x = 31x$$

31x



46) If the sum of the numbers in column C is equal to the sum of the numbers in row D, then find the value of Y.

$$8 + 1 + X + Y + 3 = 11 + 4 + X + 1 + 5 =$$

$$12 + X + Y = 21 + X \text{ Subtract X from both sides.}$$

$$12 + Y = 21$$

$$Y = 9$$

9

47) Which of the following expressions is equivalent to the expression $2 - 2x$ for all values of x ?

b) $6 - (2x + 4)$

$$\begin{aligned} & 6 - (2x + 4) \\ &= 6 - 2x - 4 \\ &= 2 - 2x \end{aligned}$$

48) If $k + m = 53$ and $j + p = 20$, what is the value of $(5k + 5m)(2j + 2p)$?

e) 10600

$$\begin{aligned} & (5k + 5m)(2j + 2p) = \\ & 5(53)(2)(20) = 10600 \end{aligned}$$

49) If $6a - 3b = 52$ and $b = 4$, find a .

b) $\frac{32}{3}$

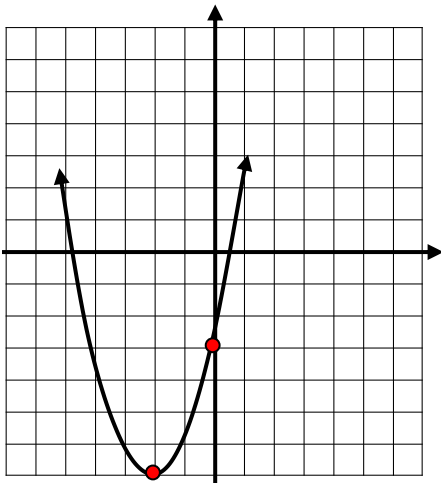
$$\begin{aligned} & 6a - 3b = 52 \\ & 6a - 3(4) = 52 \\ & 6a - 12 = 52 \\ & 6a = 64 \\ & a = \frac{64}{6} \\ & a = \frac{32}{3} \end{aligned}$$

50) Michele sells advertising in a local magazine. She makes \$450 per week plus \$50 for every new full page ad she sells that week. If she wants to make at least \$3000 so she can take a trip to Bali, how many ads will she need to sell?

$$\begin{aligned} & \text{Let } a = \# \text{ of ads sold} \\ & 450 + 50a = 3000 \\ & 50a = 2550 \\ & a = 51 \end{aligned}$$

51

51) The graph shows $f(x) = (x + 2)^2 - 7$.



Which of the following is a point on $f(x)$?
Choose all correct answers

a) $(-2, -7)$

c) $(0, -3)$

If you are not sure that a point is on the graph, “plug it” into the equation. Think of $f(x)$ as the same thing as y .

Ex. Is $(0, -3)$ on the graph?

$$f(x) = (x + 2)^2 - 7$$

$$-3 = (0 + 2)^2 - 7$$

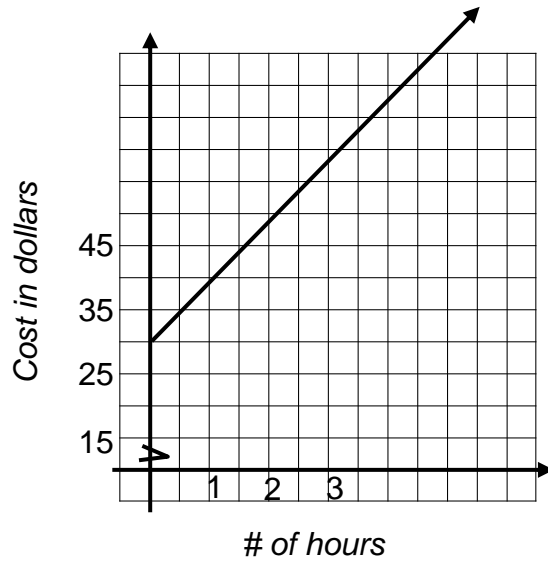
$$-3 = 4 - 7$$

$$-3 = -3 \quad \text{Yes, it is!}$$

52) Simplify the expression: $5 - 3(2x - 5) + 4(x - 1)$.

$$\boxed{-2x + 16}$$

$$\begin{aligned} & 5 - 3(2x - 5) + 4(x - 1) \\ &= 5 - 6x + 15 + 4x - 4 \quad \text{combine similar terms} \\ &= -2x + 16 \end{aligned}$$



For 0 hours, the cost is \$30 so that is the “flat rate”.

After 1 hour, the price is \$40. So, $\$40 - \$30 = \$10$.

Therefore the hourly charge is \$10.

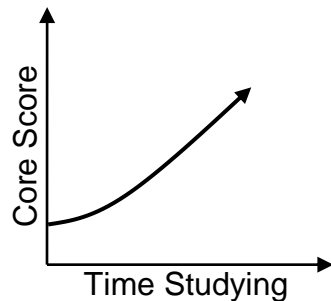
53) The graph above represents the cost of renting a bike. What is the flat rate and what is the hourly charge?

b) Flat rate \$30

Hourly rate \$10

54) We all know that the more time we spend studying for a test the higher our test score will be. Which of the following graphs could be the graph of the relationship between time studying and score on the CORE test?

a)



As the time put in studying increases, your score increases!!

- 55) Rosa deposits \$1,600 in her bank. It is all in twenties and tens. If z represents the number of twenty dollar bills, which of the following represents the number of ten dollar bills?

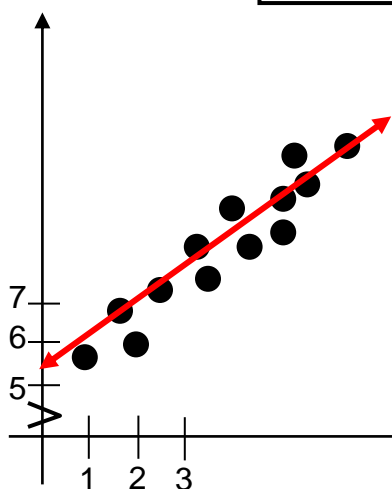
c) $\frac{1600 - 20z}{10}$

**We need to make up a letter to stand for the number of ten dollar bills.
Let $T = \#$ of ten dollar bills.**

$$20z + 10T = 1600 \text{ Now solve for } T.$$

$$10T = 1600 - 20z$$

$$T = \frac{1600 - 20z}{10}$$



The points are rising to the right so we must choose an answer with a positive slope. If a line were drawn through the points it would intersect the y-axis around 5.5 or $11/2$.

- 56) Which of the following linear models best fits the data shown in the scatterplot above?

b) $y = x + \frac{11}{2}$

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

Bonus: Which of the following are true? Select all correct answers.

b) I 'm good at math.

e) I LOVE MATH!!