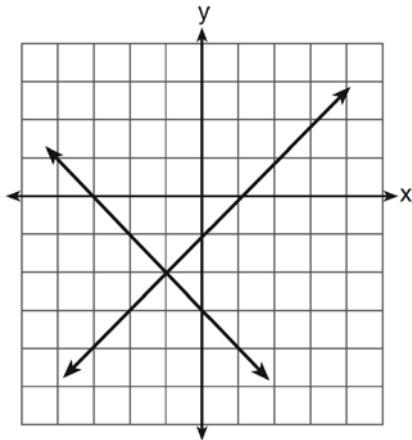


A.REI.C.6: Graphing Linear Systems

1 Rowan has \$50 in a savings jar and is putting in \$5 every week. Jonah has \$10 in his own jar and is putting in \$15 every week. Each of them plots his progress on a graph with time on the horizontal axis and amount in the jar on the vertical axis. Which statement about their graphs is true?

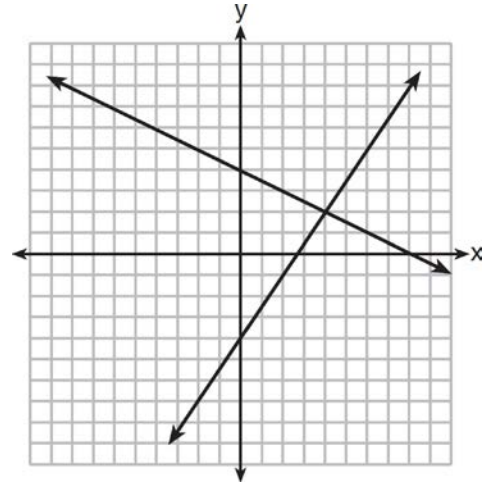
- 1) Rowan's graph has a steeper slope than Jonah's.
- 2) Rowan's graph always lies above Jonah's.
- 3) Jonah's graph has a steeper slope than Rowan's.
- 4) Jonah's graph always lies above Rowan's.

2 What is the solution of the system of equations shown in the graph below?



- 1) $(1, 0)$ and $(-3, 0)$
- 2) $(0, -3)$ and $(0, -1)$
- 3) $(-1, -2)$
- 4) $(-2, -1)$

3 A system of equations is graphed on the set of axes below.



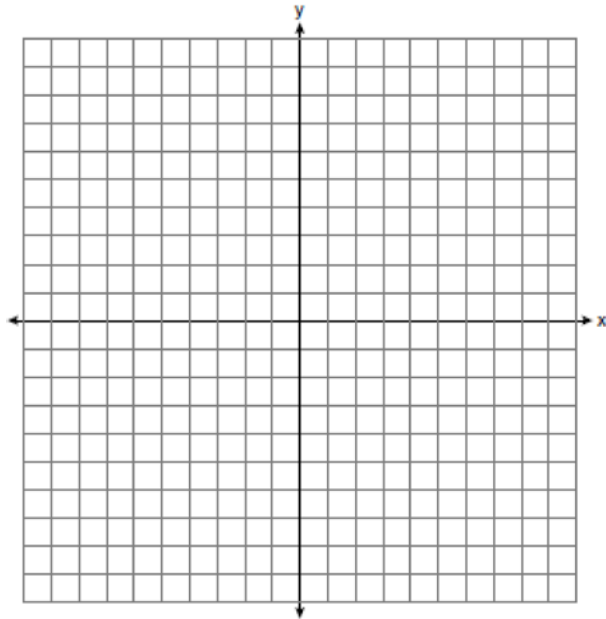
The solution of this system is

- 1) $(0, 4)$
- 2) $(2, 4)$
- 3) $(4, 2)$
- 4) $(8, 0)$

- 4 On the set of axes below, solve the following system of equations graphically. State the coordinates of the solution.

$$y = 4x - 1$$

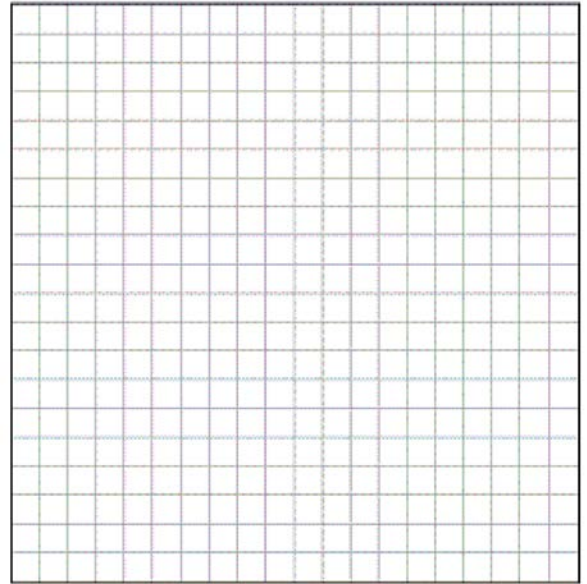
$$2x + y = 5$$



- 5 On the grid below, solve the system of equations graphically for x and y .

$$4x - 2y = 10$$

$$y = -2x - 1$$

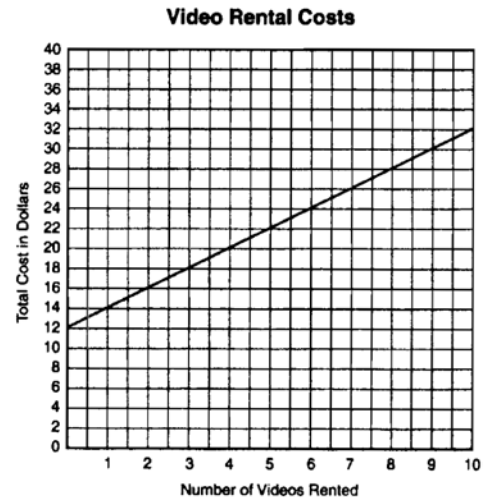


- 6 Two health clubs offer different membership plans. The graph below represents the total cost of belonging to Club *A* and Club *B* for one year.



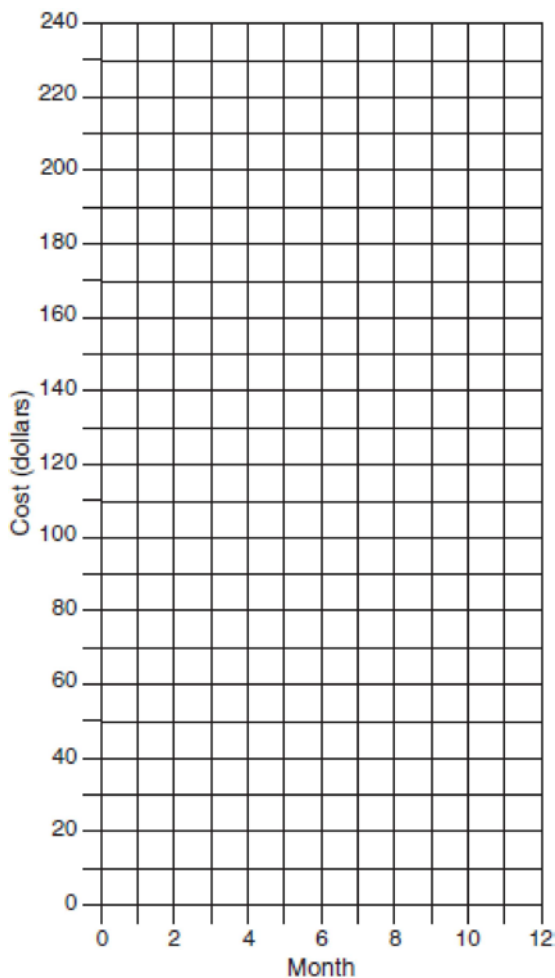
If the yearly cost includes a membership fee plus a monthly charge, what is the membership fee for Club *A*? What is the number of the month when the total cost is the same for both clubs? What is the total cost for Club *A* when both plans are the same? What is the monthly charge for Club *B*?

- 7 Two video rental clubs offer two different rental fee plans: Club *A* charges \$12 for membership and \$2 for each rented video. Club *B* has a \$4 membership fee and charges \$4 for each rented video. The graph below represents the total cost of renting videos from Club *A*.

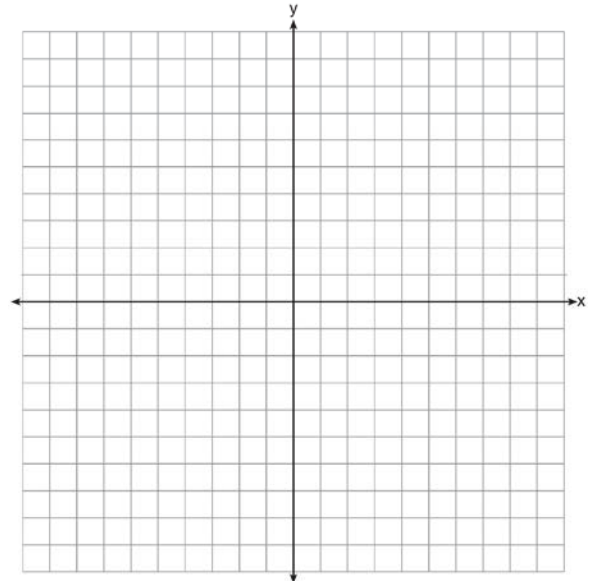


- (a) On the same set of *xy*-axes, draw a line to represent the total cost of renting videos from Club *B*.
(b) For what number of video rentals is it less expensive to belong to Club *A*? Explain how you arrived at your answer.

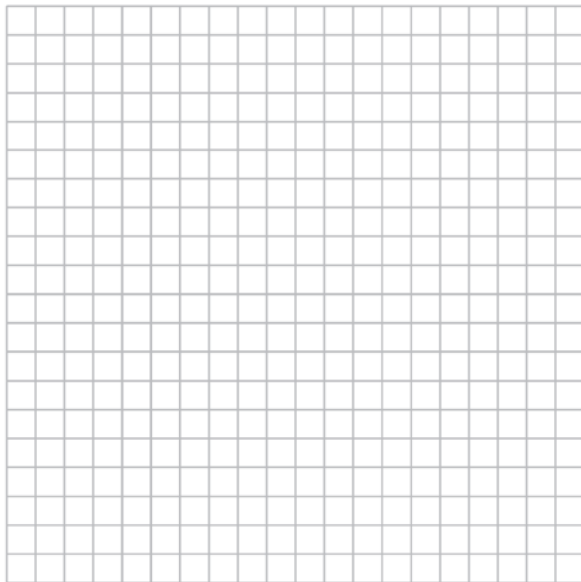
- 8 At Ron’s Rental, a person can rent a big-screen television for \$10 a month plus a one-time “wear-and-tear” fee of \$100. At Josie’s Rental, the charge is \$20 a month and an additional charge of \$20 for delivery with no “wear-and-tear” fee.
- a If c equals the cost, write one equation representing the cost of the rental for m months at Ron’s Rental and one equation representing the cost of the rental for m months at Josie’s Rental.
- b On the accompanying grid, graph and label *each* equation.
- c From your graph, determine in which month Josie’s cost will equal Ron’s cost.



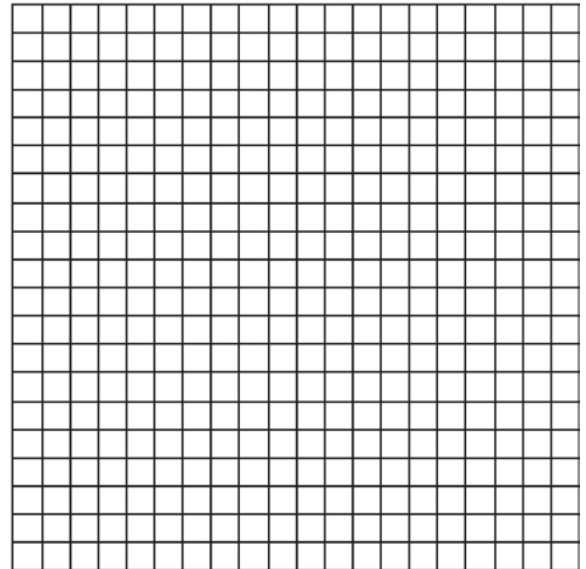
- 9 Next weekend Marnie wants to attend either carnival A or carnival B . Carnival A charges \$6 for admission and an additional \$1.50 per ride. Carnival B charges \$2.50 for admission and an additional \$2 per ride.
- a) In function notation, write $A(x)$ to represent the total cost of attending carnival A and going on x rides. In function notation, write $B(x)$ to represent the total cost of attending carnival B and going on x rides.
- b) Determine the number of rides Marnie can go on such that the total cost of attending each carnival is the same. [Use of the set of axes below is optional.]
- c) Marnie wants to go on five rides. Determine which carnival would have the lower total cost. Justify your answer.



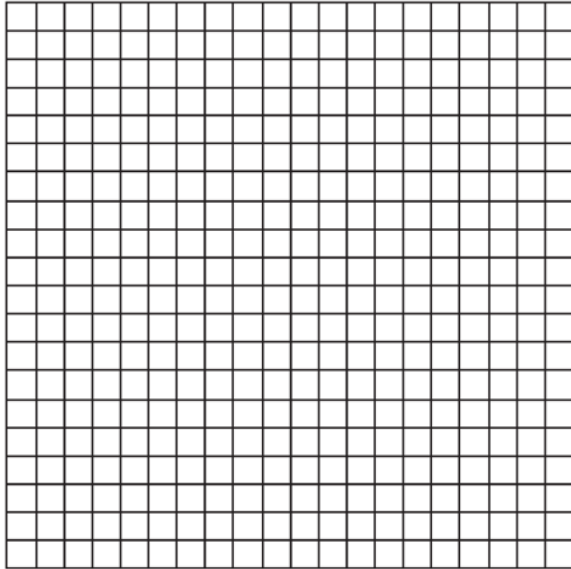
10 A local business was looking to hire a landscaper to work on their property. They narrowed their choices to two companies. Flourish Landscaping Company charges a flat rate of \$120 per hour. Green Thumb Landscapers charges \$70 per hour plus a \$1600 equipment fee. Write a system of equations representing how much each company charges. Determine and state the number of hours that must be worked for the cost of each company to be the same. [The use of the grid below is optional.] If it is estimated to take at least 35 hours to complete the job, which company will be less expensive? Justify your answer.



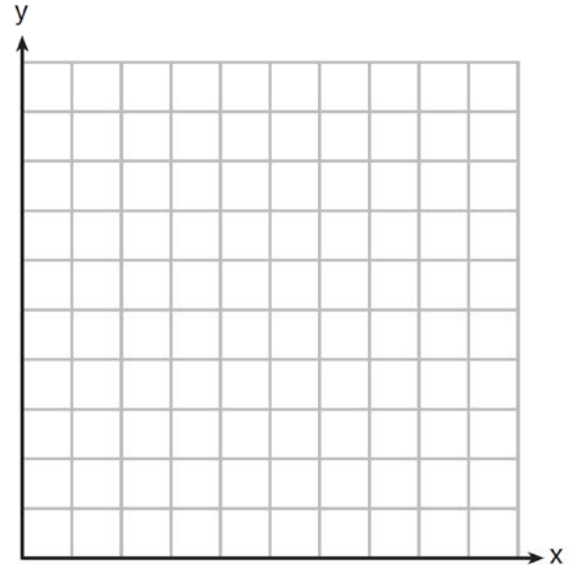
11 Currently, Tyrone has \$60 and his sister has \$135. Both get an allowance of \$5 each week. Tyrone decides to save his entire allowance, but his sister spends all of hers each week plus an additional \$10 each week. After how many weeks will they each have the same amount of money? [The use of the grid is optional.]



- 12 Island Rent-a-Car charges a car rental fee of \$40 plus \$5 per hour or fraction of an hour. Wayne's Wheels charges a car rental fee of \$25 plus \$7.50 per hour or fraction of an hour. Under what conditions does it cost *less* to rent from Island Rent-a-Car? [The use of the accompanying grid is optional.]

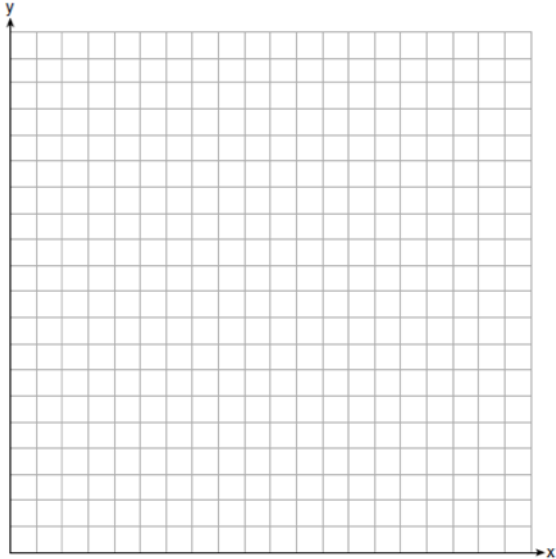


- 13 Franco and Caryl went to a bakery to buy desserts. Franco bought 3 packages of cupcakes and 2 packages of brownies for \$19. Caryl bought 2 packages of cupcakes and 4 packages of brownies for \$24. Let x equal the price of one package of cupcakes and y equal the price of one package of brownies. Write a system of equations that describes the given situation. On the set of axes below, graph the system of equations.



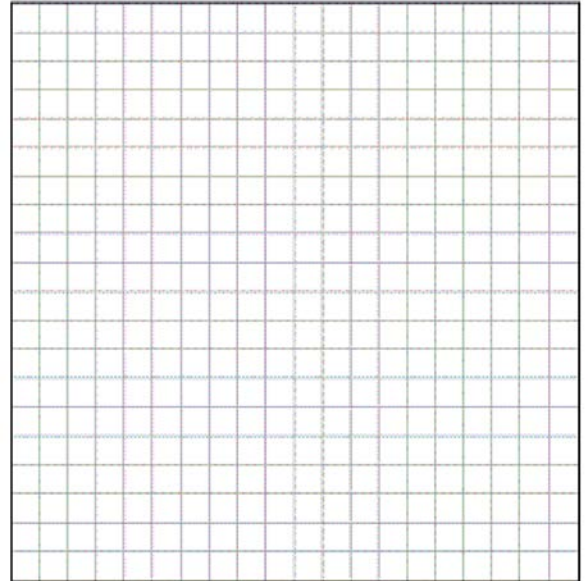
Determine the exact cost of one package of cupcakes and the exact cost of one package of brownies in dollars and cents. Justify your solution.

- 14 Central High School had five members on their swim team in 2010. Over the next several years, the team increased by an average of 10 members per year. The same school had 35 members in their chorus in 2010. The chorus saw an increase of 5 members per year. Write a system of equations to model this situation, where x represents the number of years since 2010. Graph this system of equations on the set of axes below.



Explain in detail what each coordinate of the point of intersection of these equations means in the context of this problem.

- 15 Zeke and six of his friends are going to a baseball game. Their combined money totals \$28.50. At the game, hot dogs cost \$1.25 each, hamburgers cost \$2.50 each, and sodas cost \$0.50 each. Each person buys one soda. They spend all \$28.50 on food and soda. Write an equation that can determine the number of hot dogs, x , and hamburgers, y , Zeke and his friends can buy. Graph your equation on the grid below.



Determine how many different combinations, including those combinations containing zero, of hot dogs and hamburgers Zeke and his friends can buy, spending all \$28.50. Explain your answer.

A.REI.C.6: Graphing Linear Systems Answer Section

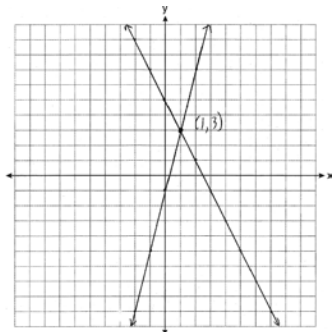
1 ANS: 3
 $15 > 5$

REF: 081502ai

2 ANS: 3 REF: 011304ia

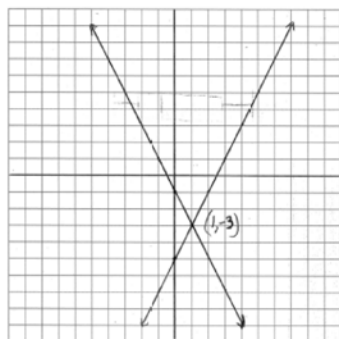
3 ANS: 3 REF: 081201ia

4 ANS:



REF: 011235ia

5 ANS:



REF: 080938ia

6 ANS:

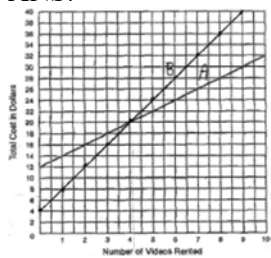
$$15x + 50 = 10x + 75$$

$$\$50, 5, \$125, \$10. \quad 5x = 25 \quad . \quad 15(5) + 50 = 125$$

$$x = 5$$

REF: 089935a

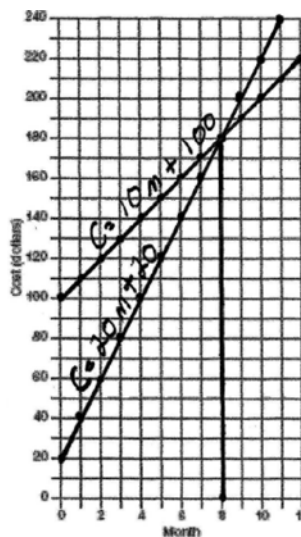
7 ANS:



. It is less expensive to rent 5 or more videos from Club A, as indicated from the graph above.

REF: spring9831a

8 ANS:



a) Ron: $c = 10m + 100$, Josie: $c = 20m + 20$; b)

c) 8

REF: 060232a

9 ANS:

a) $A(x) = 1.50x + 6$ b) $1.50x + 6 = 2x + 2.50$ c) $A(x) = 1.50(5) + 6 = 13.50$ Carnival B has a lower cost.

$$B(x) = 2x + 2.50$$

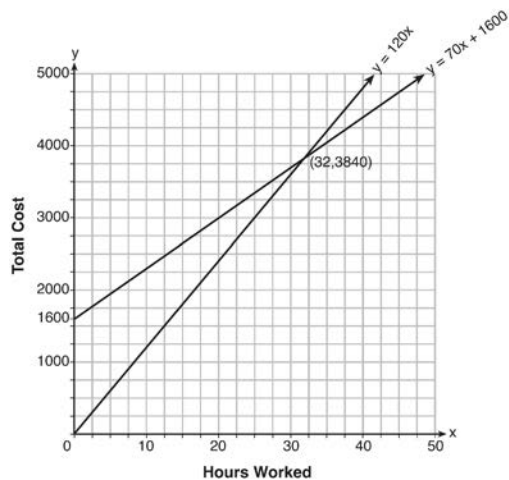
$$.50x = 3.50$$

$$B(x) = 2(5) + 2.50 = 12.50$$

$$x = 7$$

REF: spr1308ai

10 ANS:



$y = 120x$ and $y = 70x + 1600$

$120x = 70x + 1600$

$50x = 1600$

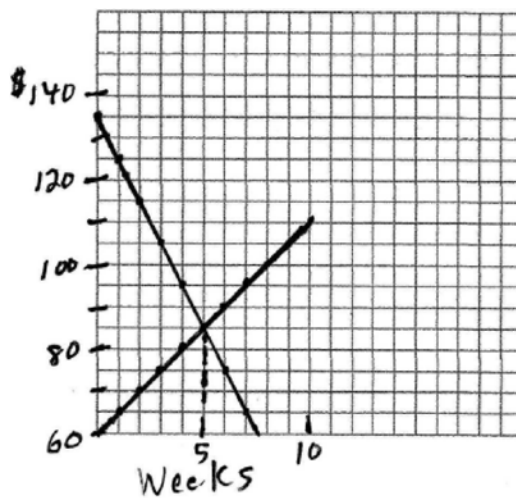
$x = 32$

$y = 120(35) = 4200$ Green Thumb is less expensive.

$y = 70(35) + 1600 = 4050$

REF: fall1315ai

11 ANS:



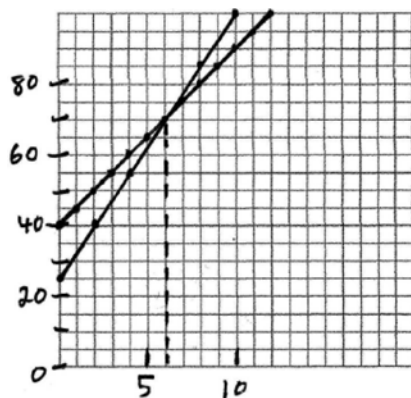
$60 + 5x = 135 - 10x$

5. $15x = 75$

$x = 5$

REF: 010329a

12 ANS:



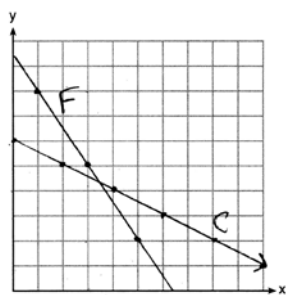
$$25 + 7.5h > 40 + 5h$$

$$h > 6. \quad 2.5h > 15$$

$$h > 6$$

REF: 060226b

13 ANS:



$$3x + 2y = 19 \quad 6x + 4y = 38 \quad 2(3.50) + 4y = 24$$

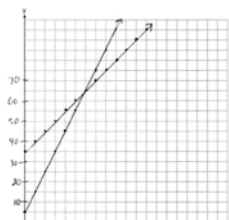
$$2x + 4y = 24 \quad 2x + 4y = 24 \quad 7 + 4y = 24$$

$$4x = 14 \quad 4y = 17$$

$$x = 3.50 \quad y = 4.25$$

REF: 061637ai

14 ANS:

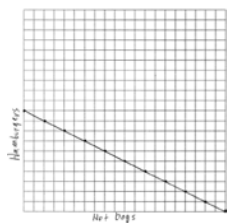


$y = 10x + 5$ In 2016, the swim team and chorus will each have 65 members.

$$y = 5x + 35$$

REF: 061737ai

15 ANS:



$$1.25x + 2.5y = 25$$

$$x + 2y = 20$$

There are 11 combinations, as each dot represents a possible combination.

REF: 081737ai