

BRONZE

1. Which are the coordinates of a point on the line with this equation?

$$y = -2x + 5$$

- 1) (-4,-3)
- 2) (-3,11)
- 3) (1,-1)
- 4) (4,3)

2.

Which point lies on the line whose equation is

$$2x - 3y = 9?$$

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

3.

Which linear equation represents a line containing the point (1,3)?

- 1) $x + 2y = 5$
- 2) $x - 2y = 5$
- 3) $2x + y = 5$
- 4) $2x - y = 5$

4.

Which point is on the line $4y - 2x = 0$?

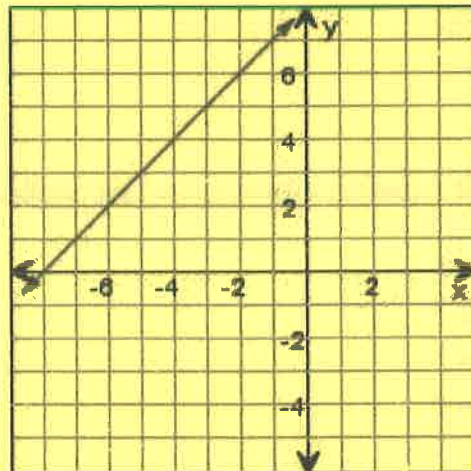
- 1) $(-2, -1)$
- 2) $(-2, 1)$
- 3) $(-1, -2)$
- 4) $(1, 2)$

5.

Name three solutions and three non-solutions to the graph shown below.

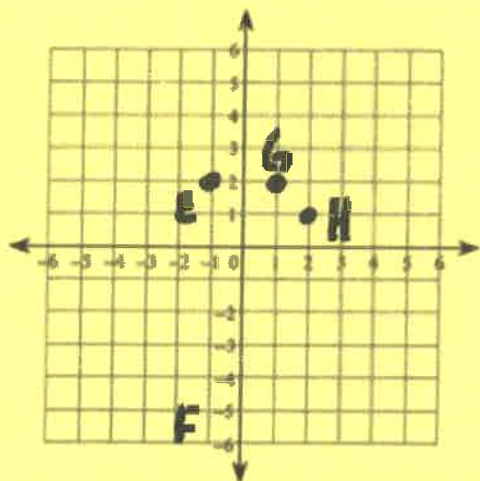
Solutions

Non-solutions



6. Mr. L graphed the function $y = -x + 3$.

Which of the points on the graph below are on this line?



- A) E and F
- B) G and H
- C) E and H
- D) F and G

ALVER

7.

The graph of the equation $x + 3y = 6$ intersects the y -axis at the point whose coordinates are

- 1) (0,2)
- 2) (0,6)
- 3) (0,18)
- 4) (6,0)

8.

Point $(k, -3)$ lies on the line whose equation is $x - 2y = -2$. What is the value of k ?

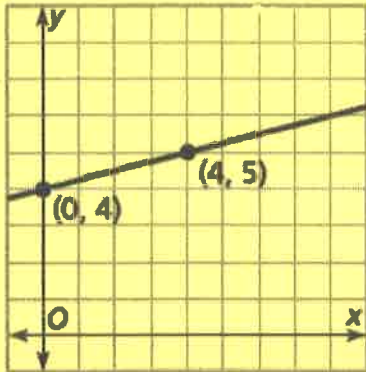
- 1) -8
- 2) -6
- 3) 6
- 4) 8

I. Slope from Graphs

Identify the slope for each graph below. Simplify your answer.

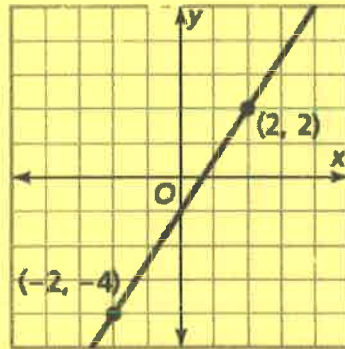
Bronze

1.



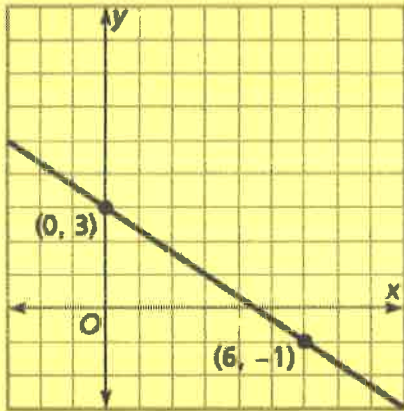
Slope = _____

2.



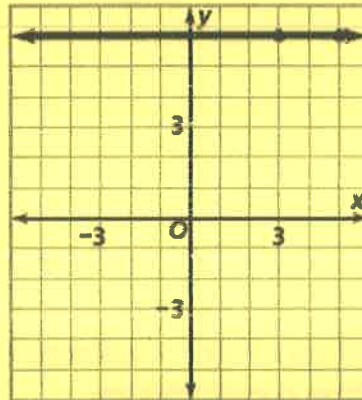
Slope = _____

3.



Slope = _____

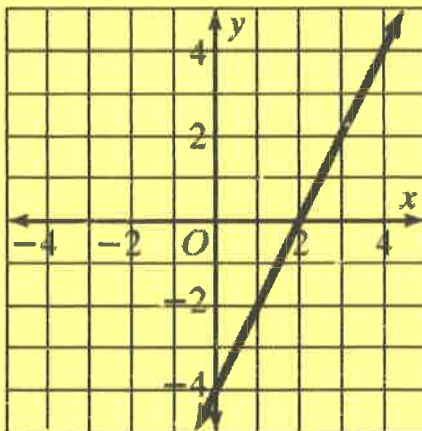
4.



Slope = _____

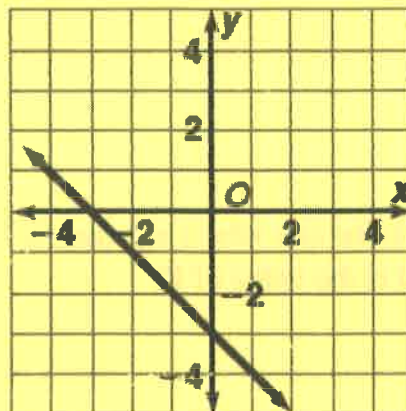
Silver

5.



Slope = _____

6.

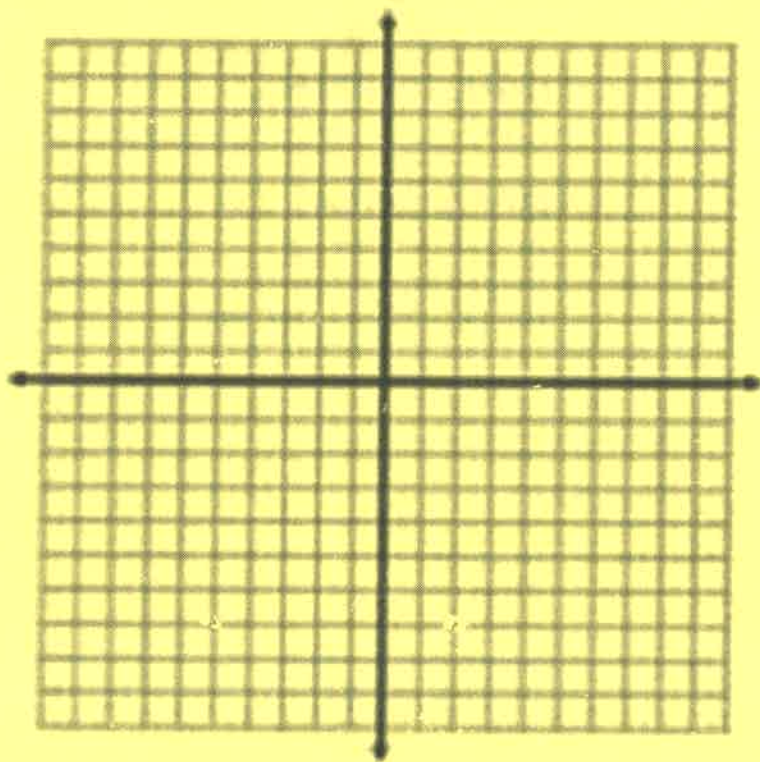


Slope = _____

GOLD

7) Find the value of y so the line that passes through $(1, 4)$ and $(-1, y)$ has a slope of 2.

Check your answer by graphing this line below.



BRONZE

Find the slope of the line through each pair of points.

1) $(-13, -14), (20, 10)$

2) $(-9, 7), (-12, 7)$

Find the slope of each linear function represented in the tables below. For each question, write whether the function is increasing, decreasing, constant, or has an undefined slope.

3.

x	y
-2	3
-1	5
0	7
1	9
2	11

4.

x	y
-3	5
-2	2
-1	-1
0	-4
1	-7

5.

x	y
5	2
5	4
5	6
5	8
5	10

Find the slope of the line through each pair of points.

6) $(-2, 7), (-9, -13)$

7) $(2, 11), (2, 5)$

8) $(13, 15), (14, 15)$

9) $(-15, -5), (-18, 11)$

10) $(-2, -10), (-4, -7)$

11) $(1, -14), (0, 14)$

12) $(-14, 19), (19, 7)$

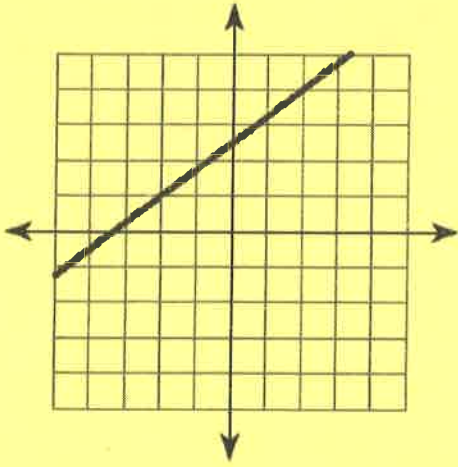
13) $(-13, 2), (-17, 13)$

14) $(14, -2), (10, -10)$

15) $(15, -18), (-10, 15)$

SILVER

Ms. Capaldi has been REALLY excited about the fact that we are graphing lines in math, because we use so many line graphs in science. She decided to grab a piece of graph paper and graphed the following line.



Ms. Koppel also wanted to get into the fun, since teaching reading can be so boring sometimes. 😊 She also graphed a line. Her line contained the points in the table below. (0,3) and (-1,-5).

x	y
0	3
-1	-5
-2	-13

Whose line had the greater rate of change?

Show your work.

GOLD

Find the value of x or y so that the line through the points has the given slope.

1) $(x, -4)$ and $(0, 2)$; slope: 6

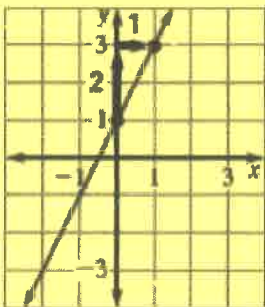
2) $(x, 9)$ and $(8, 2)$; slope: $-\frac{7}{8}$

3) $(-7, y)$ and $(-9, -6)$; slope: $\frac{3}{2}$

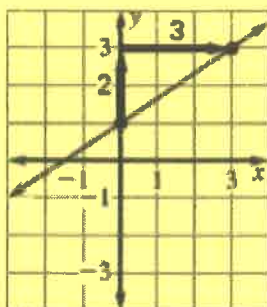
4) $(0, 0)$ and $(x, -6)$; slope: $\frac{6}{7}$

Identify the slope and y-intercept of the line whose graph is shown.

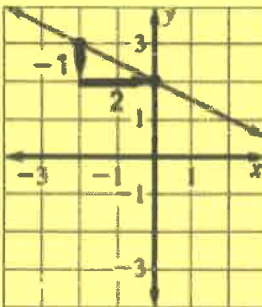
1.



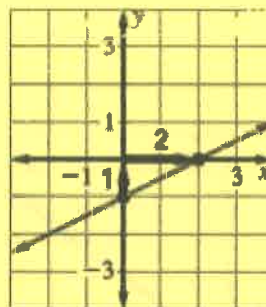
2.



3.



4.



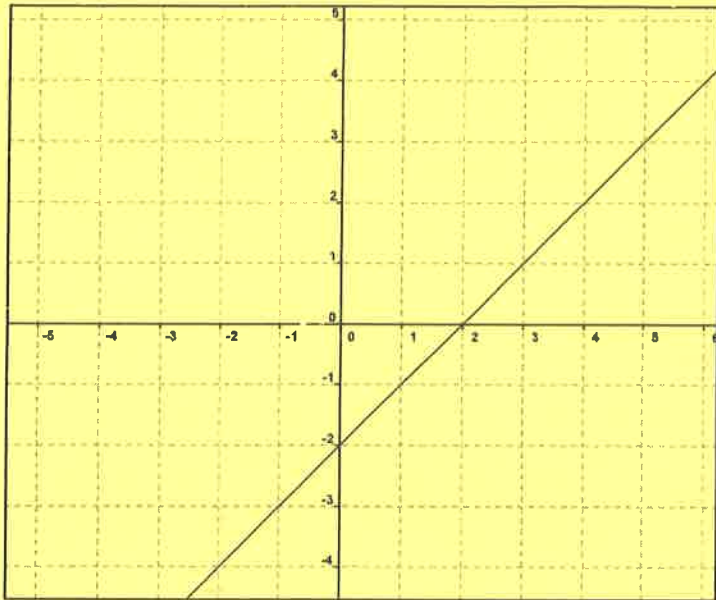
Identify the slope and y-intercept of the line with the given equation.

		SLOPE	y-intercept
5	$y = 3x + 4$		
6	$y = -2x + 8$		
7	$y = \frac{1}{2}x$		
8	$y = -\frac{3}{4}x - 1$		

SILVER

- A horizontal line passes through (5,22). Which other point could this line contain?
 - (5,2)
 - (0,22)
 - (22,5)
 - (0,5)

2. Fred drew the graph below for the equation $y = -2x + 1$. What error did he make?



GOLD

Which equation has the same y-intercept as $y = 4x - 3$?

- a) $y - 3 = x$
- b) $y = 8x + 3$
- c) $3 - y = 4x$
- d) $y = -3 + 8x$

BRONZE

1 What is the slope of the line whose equation is $2y = 5x + 4$?

- 1) 5 2) 2 3) $\frac{5}{2}$ 4) $\frac{2}{5}$

2 What is the slope of the linear equation $5y - 10x = -15$?

- 1) 10 2) 2 3) -10 4) -15

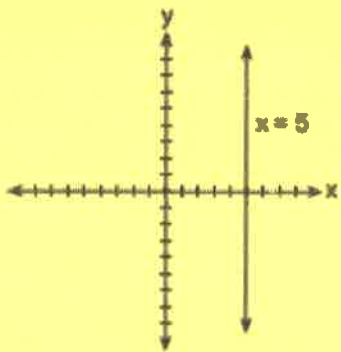
3 What is the slope of the line whose equation is $3x - 7y = 9$?

- 1) $-\frac{3}{7}$ 2) $\frac{3}{7}$ 3) $-\frac{7}{3}$ 4) $\frac{7}{3}$

4 What is the slope of the line whose equation is $3x - 4y - 16 = 0$?

- 1) $\frac{3}{4}$ 2) $\frac{4}{3}$ 3) 3 4) -4

5 The accompanying figure shows the graph of the equation $x = 5$.



What is the slope of the line $x = 5$?

- 1) 5 2) -5 3) 0 4) undefined
-

SILVER

6. Write an equation of a line that is parallel to the x-axis. What is its slope?
7. Write an equation of a line that has an undefined slope.
8. Which equation models a line with the same y-intercept but half the slope of the line $y = 4 - 10x$?
- a. $y = -5x + 4$
 - b. $y = 2 - 10x$
 - c. $y = 2 - 5x$
 - d. $y = -5x - 2$

GOLD

9. Consider the equation $ky + 2x = 8$. For what value of k will the slope be 1?
10. A line contains $(9, y)$ and $(-6, 3)$. It has slope $\frac{2}{3}$. Find y .
11. Which of the following is the equation of a line that has the same slope as $y = -\frac{3}{2}x + 2$ and the same y-intercept as $y = 3x - 2$? (Ask Mr. L if to see if you figured out the correct answer! 😊)
- a) $y - 2 = -\frac{3}{2}x$
 - b) $-\frac{3}{2}x = y + 2$
 - c) $y + 2 = -\frac{3}{2}$
 - d) $-\frac{3}{2}x = y + 3$

BRONZE

1.

PART A

An online store sells T-shirts for \$11 each. The store charges a \$9 shipping and handling fee no matter how many shirts a customer orders. Which equation best represents y , the total cost in dollars, of buying x T-shirts from this online store?

A. $11 + 9 + x = y$

B. $11 + 9x = y$

C. $11x + 9 = y$

D. $11x + 9x = y$

PART B

Explain the meaning of slope in the equation you chose above.

2.

Mr. L wanted to order some custom T-shirts that say "ALGEBRA IS LIFE" on them. He got two sales quotes from two different companies.

- MONSTER T-shirt Company charges \$12 per shirt.
- CRAZY T-shirt Company charges a flat fee of \$10 for the design, and then \$8 per shirt.

PART A

Write a linear function to model the relationship between the total cost and the number of shirts ordered for each company.

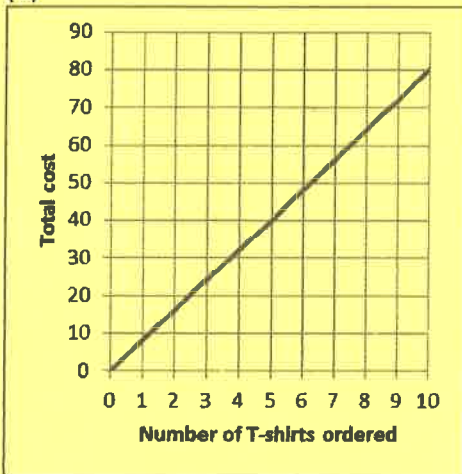
Equation for MONSTER

Equation for CRAZY

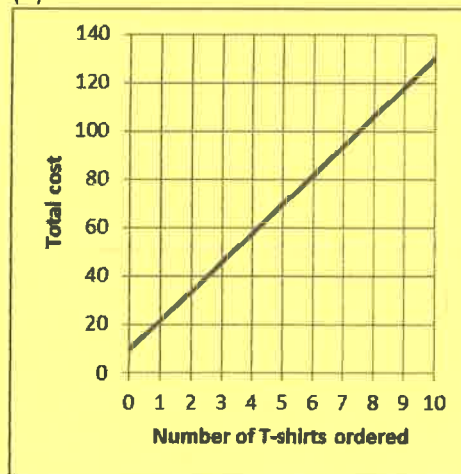
PART B. Which of the following graphs below corresponds to MONSTER? _____

PART C. Which of the following graphs corresponds to CRAZY? _____

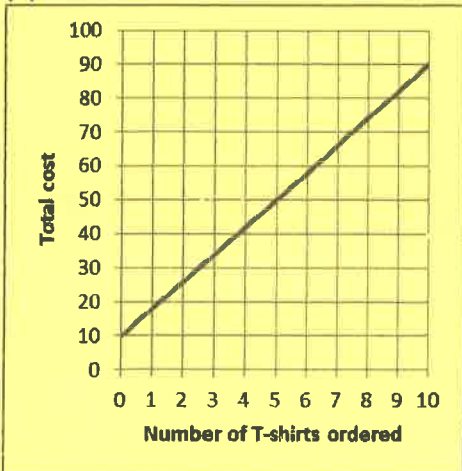
(1)



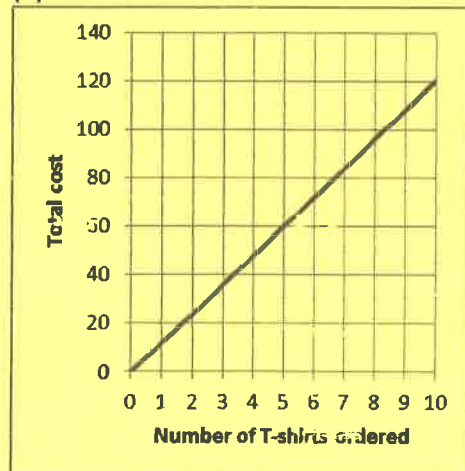
(3)



(2)



(4)



3.

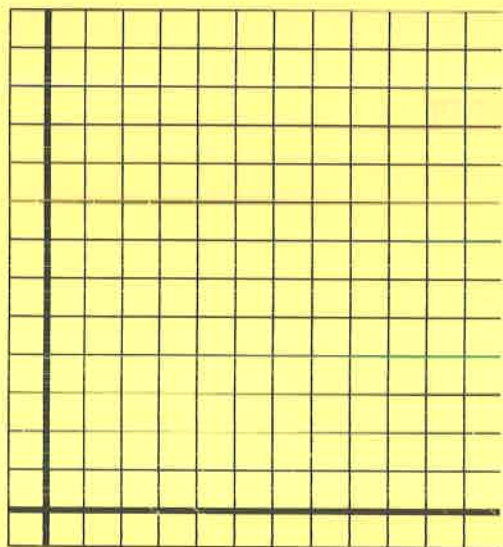
A fish tank starts with 10 gallons of water. It needs to be emptied to be cleaned. The water is drained at a rate of 2 gallons per minute until it is empty.

PART A

Write a linear function to model the amount of water left as a function of time.

PART B

Graph your equation below.



PART C

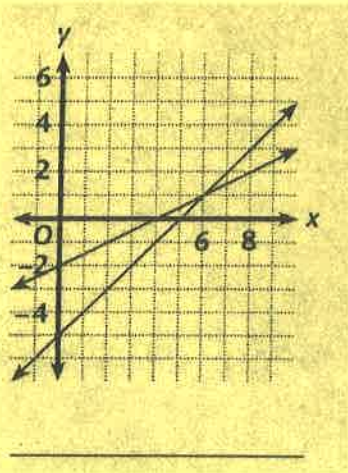
What is the initial value of this function?

PART D

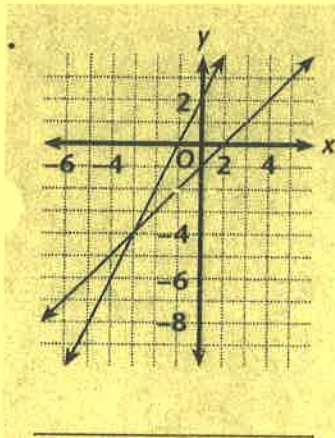
Interpret the meaning of slope in the context of this problem.

BRONZE

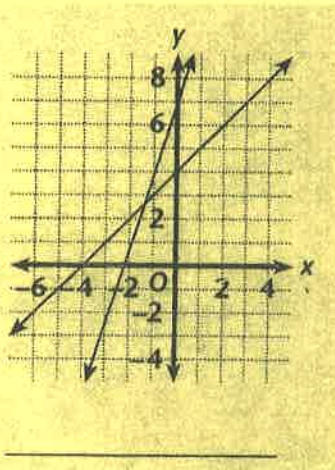
For each system of linear equations graphed below, determine the solution. Estimate where necessary.



8.



9.



SILVER

10. Consider the equation $y = -\frac{2}{3}x + 4$. Write an equation for each letter below that would create a system with...

A) no solutions

B) one solution

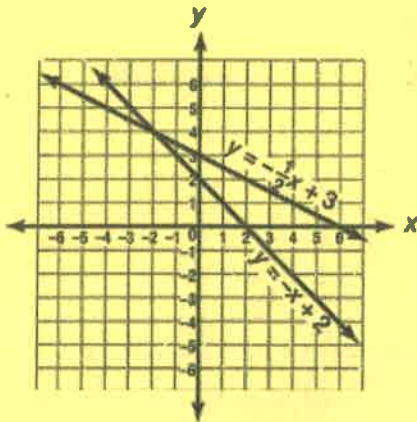
C) infinite solutions

GOLD

11. CHALLENGE: The solution of the system of equations $Ax + y = 5$ and $Ax + By = 20$ is $(2, -3)$. What are the values of A and B?

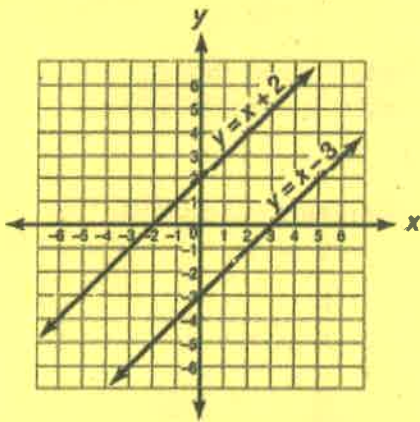
BRONZE

- 1 What is the solution of the system of linear equations graphed below?



- A (4, -2) C (0, 3)
 B (0, 2) D (-2, 4)

- 2 What is the solution of the system of linear equations graphed below?



- F all ordered pairs on both lines
 G There is no solution.
 H (0, 2)
 J (0, -3)

- 3 Roland has to find the solution of this system of linear equations.

$$2y = 4x - 2$$

$$3y = 6x - 3$$

Without graphing, what is the solution?
 [Hint: Divide both sides of the first equation by 2, and divide both sides of the second equation by 3. Then compare the equations.]

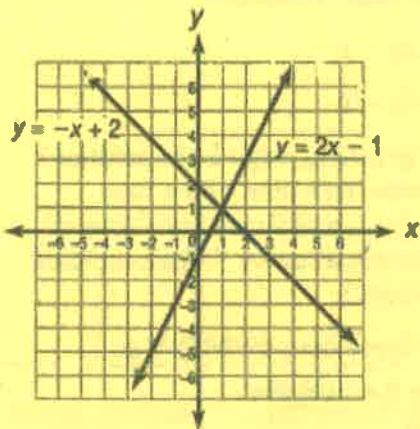
- A all ordered pairs on both lines
 B There is no solution.
 C (0, -2)
 D (0, -3)

- 4 If two lines are parallel, what do you know about their equations?

- F They have all their solutions in common.
 G They have no solutions in common.
 H They have exactly one solution in common.
 J They have exactly two solutions in common.

5

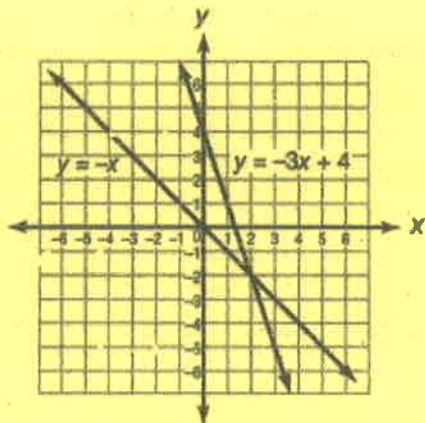
What is the solution of the system of linear equations graphed below?



- A (2, -1)
- B (2, 2)
- C (1, 1)
- D (1, 2)

6

What is the solution of the system of linear equations graphed below?



- F (2, -2)
- G (-2, 2)
- H (2, 2)
- J (0, 4)

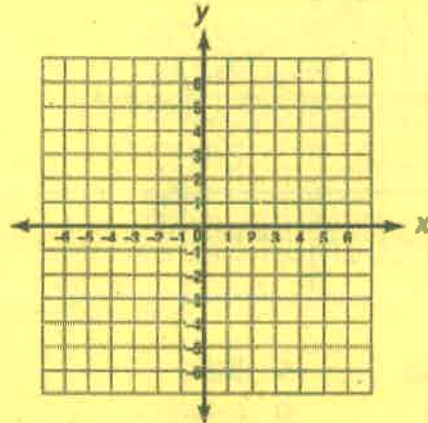
7

What is the solution of this system of linear equations?

$$y = x + 4$$

$$y = \frac{1}{3}x + 2$$

Use the grid to sketch the graphs.



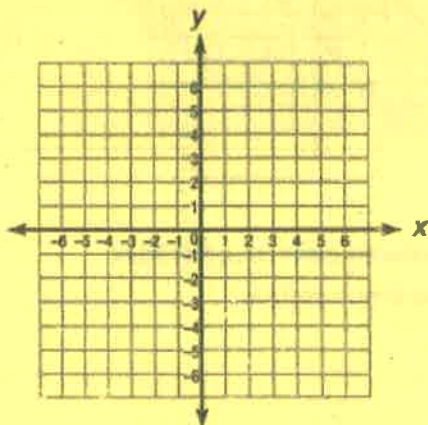
- A (-2, 2)
- B (-3, 1)
- C (-1, 3)
- D (4, 2)

8

What is the solution of this system of linear equations? Write your answer.

$$y = \frac{4}{3}x \quad y = x + 1$$

Use the grid to sketch the graphs.



Answer _____

GOLD

9. In the fall, the math club and science club each created an Internet site. You are the webmaster for both sites. It is now January and you are comparing the number of times each site is visited each day.

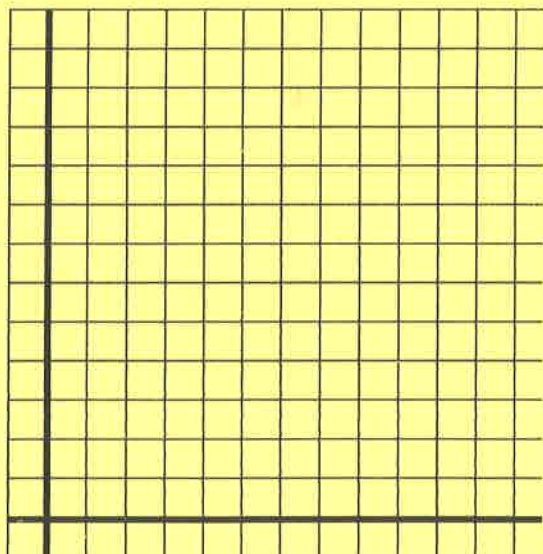
Science club: There are currently 400 daily visits and the visits are increasing at a rate of 25 daily visits per month.

Math club: There are currently 150 daily visits and the visits are increasing at a rate of 50 daily visits per month.

- A. Use mental math/logic to **predict** when the number of visits at the two sites will be the same.

- B. Write a system of linear equations to represent the situation. Then graph to find out exactly when the number of daily visits to each club will be equal. Define your variables.

(Create your own graph. Hint: Use a scale of 100 on the y-axis)



- C. Name the solution to this system, and explain what it means to the problem.

