

Algebra 1 Summer Packet For All Students Entering Algebra 1

The mathematics teachers at North Bergen High School want all students to be successful in their classes. This packet has been designed so that students can preserve their mathematics skills during the summer. The completion of this packet will count as their first grade in Algebra 1. In order to receive full credit, students must show ALL work. NO work, NO credit! Completed packets are due the first day of school. Have a great summer!

1. Write the algebraic expression for each word phrase.

A. 7 less than the quotient of a number 5 and w

B. 5 times the quantity 7 minus a number f

2. Simplify each expression.

A. $5 + 5 \times (24 \div 12)^3$

B. $5(2 - j) + (2j - 3)$

3. What is the reciprocal of $9\frac{8}{11}$?

4. Estimate the value to the nearest tenth.

$$\sqrt{75}$$

5. Name the following parts of the expression. $6x^2 - 2x + 11$

A. exponent

B. coefficient

C. constant

6. Evaluate the expression for $s = 2$ and $t = 5$. $-4(s)^2 + t^3 + 5$

7. Evaluate the expression for $x = 3$ and $y = 2$ $\left(\frac{x+1}{y^2}\right)^2$

8. Name the property the statement illustrates.

A. $35 \cdot x = x \cdot 35$

B. $3 \cdot (-1 \cdot p) = 3 \cdot (-p)$

9. If a number has an even exponent can it ever be negative when it is simplified? Explain.

10. Write an equation with the solution of -4. Show the work that proves your equation is correct.

11. Write the word phrase for the equation $7x + 10 = 14 \div x$

12. Tell whether the ordered pair is a solution to the equation. Explain.

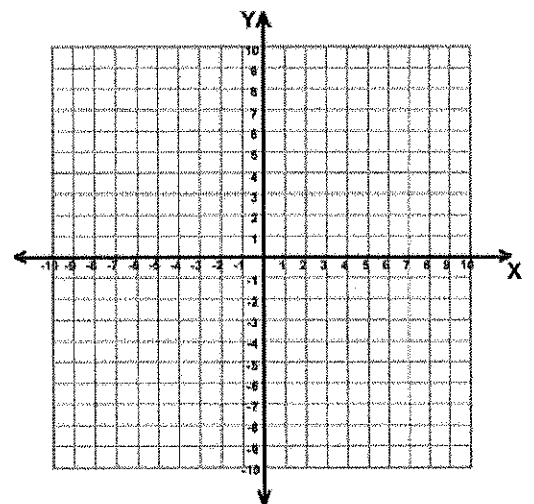
A. $y = -x - 2$; (1, -3)

B. $y = 3(5 - x)$; (3, 6)

13. A pizzeria charges \$12 for a large pizza, plus a \$3 delivery fee. Use a table, an equation, and a graph to describe the relationship between the number of pizzas delivered and the total cost.

14. The table shows the number of words a secretary types in terms of minutes. How many words can he type in 60 minutes?

Minutes	Words
5	310
10	620
15	930
20	1240
25	1550



Chapter 2

Solve each proportion.

1. $\frac{2}{1.2} = \frac{5}{k}$

2. $\frac{12}{48} = x$

3. $\frac{m-4}{20} = \frac{5m+3}{4}$

Solve each equation. Check your answer.

4. $7y + 5 = 3y - 31$

5. $\frac{1}{2}(t + 7) = 32$

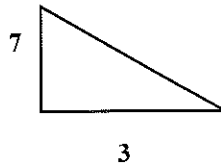
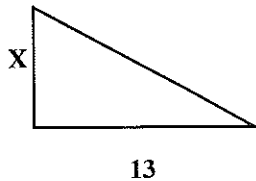
6. $\frac{2h-6}{6} = \frac{2}{3}$

7. $\frac{7}{x} = 14$

8. A cheetah ran 300 feet in 2.92 seconds. What was the cheetah's average speed in miles per minute?

The figures are similar. Find the missing length.

9.



10. A tree casts a 26-ft shadow. A boy standing nearby casts a 12-ft shadow, forming similar triangles. His height is 4.5 ft. How tall is the tree?

Tell whether each percent of change is an increase or decrease. Then find the percent of change.

11. Original amount: \$90

New amount: \$84.50

12. Original amount: \$100

New amount: \$140

Solve each equation.

13. $\frac{5}{4} + \frac{2x}{3} = \frac{7}{12}$

14. $\frac{3x}{5} + \frac{8}{2} = 10$

15. $\frac{x}{4} - 6 = 2$

16. $3(x - 5) = 5x - 6 - 2x$

For problems 17 and 18, declare a variable, write an equation and solve

17. An online music club sells compact discs for \$13.95 each plus \$1.95 shipping and handling per order. If Maria's total bill was \$85.65, how many compact discs did Maria purchase?

18. You are trying to choose between two gym options. For a monthly plan, Planet Fitness has a fee of \$15 plus also costs \$2.50 every time you go. Bay State Gym's fee is \$30 but is only \$1 every time that you go. At what point do the 2 gym's cost the same amount of money? Which option would you choose based upon your personal preference?

19. The scale of a map is 3 cm : 50 mi. Determine the distance between two cities that are 4.2 cm apart on the map.

20. The sum of 4 consecutive integers is 78. What are the 4 integers?

21. The sum of 4 consecutive odd integers is 24. What are the 4 integers?

22. There are 20 squid and 36 eels in a fish tank. What is the ratio of squid to eels? What is the rate of squid to eels? What about the simplified ratio and unit rate?

23. Write a proportion to solve this problem.

When planning for their wedding reception Joey and Sarah were told that Riverside Gallery would charge \$550 to use their function room for the 60 guests they planned on inviting. They have since changed their plans and expect to invite 107 guests. How much should they plan to pay for the function room?

24. Sally bought 30 of the same present for her friends to give away at her birthday party. She initially purchased 18 online for a cost of \$42. She then realized she needed more so she drove to the store and purchased 12 more of the same item for \$20. Which place offered the better deal? Show the work that justifies your answer.

25. Solve for R

$$\frac{CR}{B} = 2v$$

26. Solve for y

$$\frac{rw+y}{6} = f$$

27. Solve for x

$$ax + bx = t$$

28. You were supposed to Thunder Muscle energy Drink for \$3.10 per can. In your haste to get it on the shelves, you mistakenly marked the price as \$2.46. What was the percent error (relative error) in your prices?

29. The Town of Hingham just found the area of the Shipyard complex rounded to the nearest meter. If the rectangular complex is measured 100m by 340 m, then what is the possible measurement error due to the fact that they rounded to the nearest meter?

30. You are trying to save up to buy the new iPhone 6 which is supposed to come out 18 months from now. You put \$300 into a savings account that yields 3.6% annually. If the phone is going to cost \$345 will you have enough money to buy it?

Solve

31. 15% of 23 is what #?

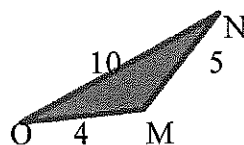
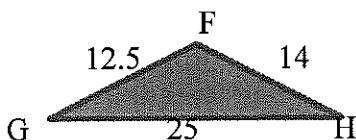
32. 18 is what % of 40?

33. 36 is 125% of what #?

34. What # is 42% of 60?

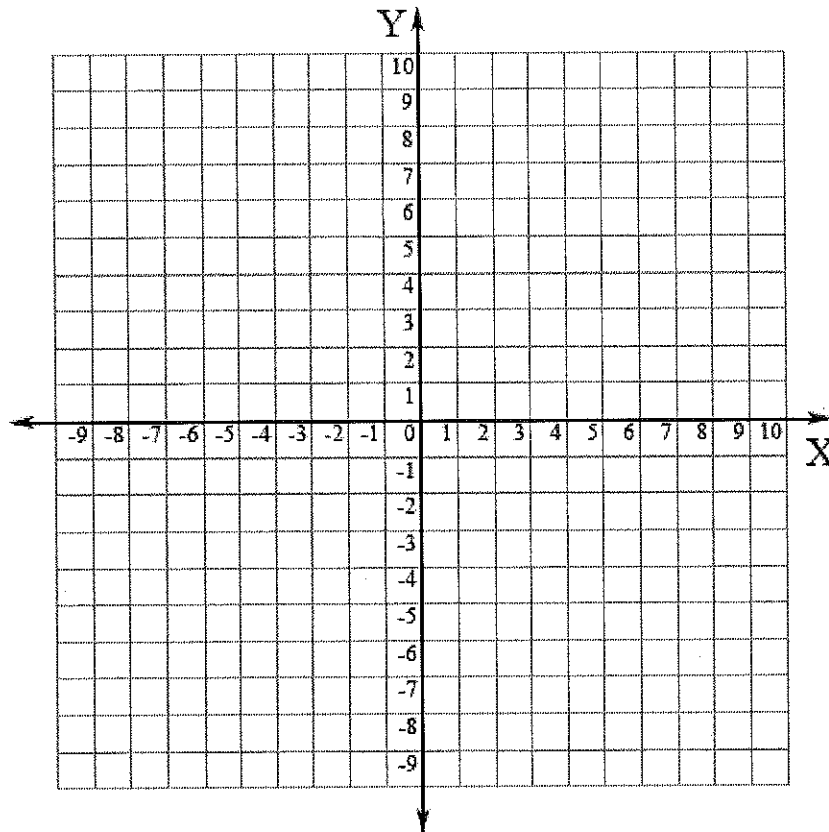
35. A player's batting average is the number of hits divided by the number of at bats. If Jenny has a batting average of .329 and has 150 hits then how many times has she been at bat? Declare a variable, write an equation, and solve.

36. Joey thinks that $\triangle FGH \sim \triangle MNO$. Prove whether he is correct or not.



The Coordinate System

- A **coordinate system**, or coordinate plane, is used to locate points in a 2-dimensional plane.
- The horizontal number line is the _____.
- The vertical number line is the _____.
- Their intersection is the _____. (Label)



- The coordinate plane contains four quadrants (I, II, III, IV). Label the quadrants.
- Any point can be located within one of the four quadrants in the coordinate plane using a specific ordered pair of numbers, called its _____.

(x , y)

- The first number in an ordered pair is the x-coordinate.
- The second number is the y-coordinate.

Example: **(3,2)** 3 is the x- coordinate, 2 is the y-coordinate.

- A point is defined on the coordinate plane by one, AND ONLY ONE, ordered pair.

Practice (5.3)

Tell what point is located at each ordered pair.

1. $(3, -2)$ _____ 2. $(2, 3)$ _____ 3. $(-5, 5)$ _____
4. $(-7, -8)$ _____ 5. $(-4, 4)$ _____ 6. $(-5, 0)$ _____

Write the ordered pair for each given point.

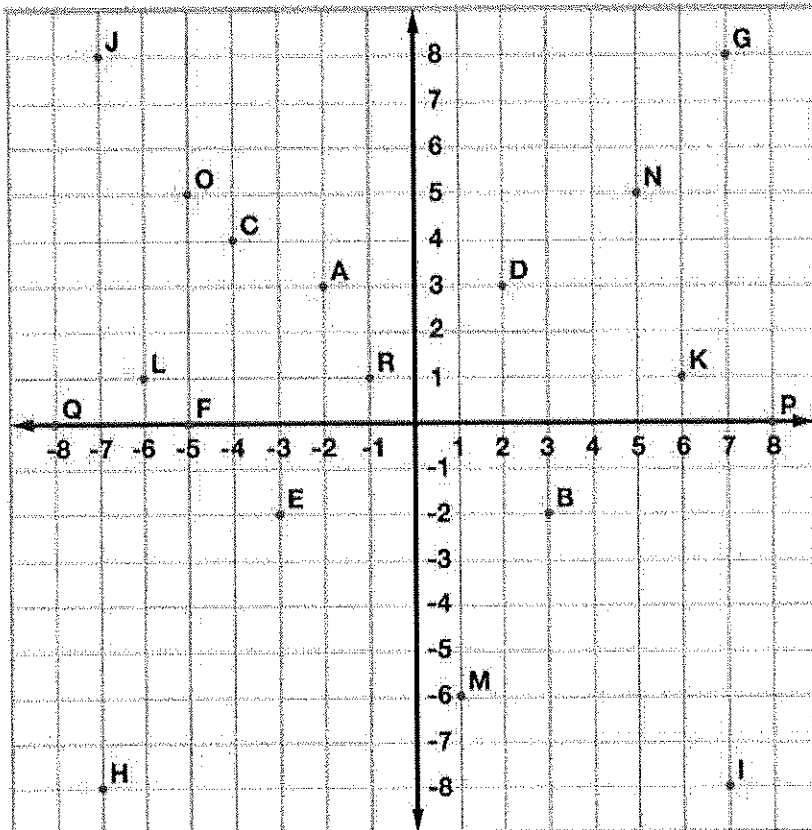
7. E _____ 8. M _____ 9. P _____
10. G _____ 11. Q _____ 12. N _____

Plot the following points on the coordinate grid.

13. S $(-6, -3)$ 14. T $(2, -4)$ 15. U $(5, 8)$

Identify the quadrant containing each point.

16. B 17. J 18. I 19. D 20. E



3-3

Study Guide and Intervention The Coordinate Plane

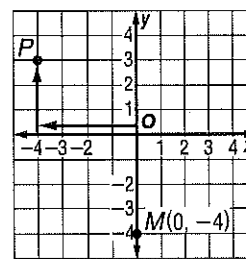
The **coordinate plane** is used to locate points. The horizontal number line is the **x-axis**. The vertical number line is the **y-axis**. Their intersection is the **origin**.

Points are located using **ordered pairs**. The first number in an ordered pair is the **x-coordinate**; the second number is the **y-coordinate**.

The coordinate plane is separated into four sections called **quadrants**.

EXAMPLE 1 Name the ordered pair for point P. Then identify the quadrant in which P lies.

- Start at the origin.
 - Move 4 units left along the *x*-axis.
 - Move 3 units up on the *y*-axis.
- The ordered pair for point P is $(-4, 3)$.
P is in the upper left quadrant or quadrant II.



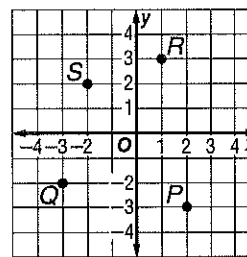
EXAMPLE 2 Graph and label the point $M(0, -4)$.

- Start at the origin.
- Move 0 units along the *x*-axis.
- Move 4 units down on the *y*-axis.
- Draw a dot and label it $M(0, -4)$.

EXERCISES

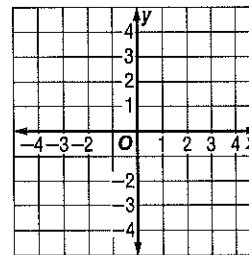
Name the ordered pair for each point graphed at the right. Then identify the quadrant in which each point lies.

- | | |
|------|------|
| 1. P | 2. Q |
| 3. R | 4. S |



Graph and label each point on the coordinate plane.

- | | |
|---------------|----------------|
| 5. $A(-1, 1)$ | 6. $B(0, -3)$ |
| 7. $C(3, 2)$ | 8. $D(-3, -1)$ |
| 9. $E(1, -2)$ | 10. $F(1, 3)$ |

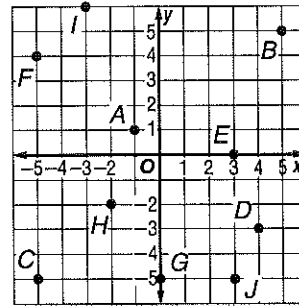


3-3

Practice: Skills

The Coordinate Plane

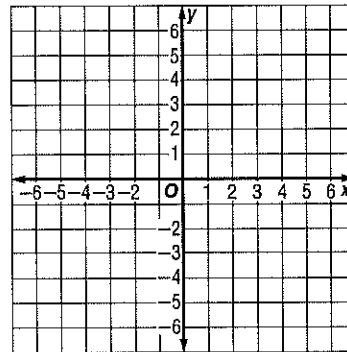
Name the ordered pair for each point graphed at the right. Then identify the quadrant in which each point lies.



- | | |
|------|-------|
| 1. A | 2. B |
| 3. C | 4. D |
| 5. E | 6. F |
| 7. G | 8. H |
| 9. I | 10. J |

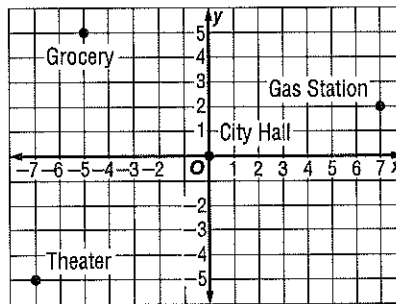
Graph and label each point on the coordinate plane.

- | | |
|-----------------|----------------|
| 11. $N(-1, 3)$ | 12. $V(2, -4)$ |
| 13. $C(4, 0)$ | 14. $P(-6, 2)$ |
| 15. $M(-5, 0)$ | 16. $K(-1, 5)$ |
| 17. $I(-3, -3)$ | 18. $A(5, -3)$ |
| 19. $D(0, -5)$ | |



Name the ordered pair for each point on the city map at the right.

20. City Hall
21. Theater
22. Gas Station
23. Grocery

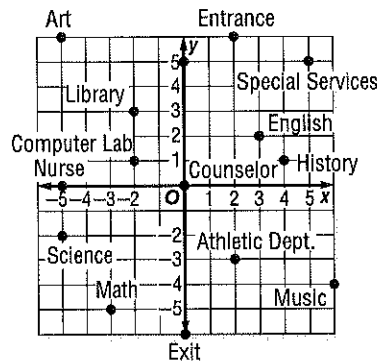


3-3

Practice: Word Problems

The Coordinate Plane

SCHOOL For Exercises 1–4, use the coordinate plane at the right. It shows a map of the rooms in a junior high school.



<p>1. Thalia is in the room located at $(-2, 1)$. What room is she in? Describe in words how to get from the origin to this point.</p>	<p>2. Thalia's next class is 8 units to the right and 5 units down on the map from where she is now. In what room is Thalia's next class? Find the ordered pair that represents the location of that room.</p>
<p>3. Tyrone is in the Art room, but his next class is in the History room. Give Tyrone directions on how to get to the History room.</p>	<p>4. On the map, which classrooms are located in the third quadrant? Describe the coordinates of all points in the third quadrant.</p>
<p>5. NEIGHBORHOOD Delsin made a map of his neighborhood in such a way that each intersection is a point on a coordinate plane. Right now, Delsin stands at point $(-4, -3)$. Give the ordered pair of where he will be if moves 5 units to the right and 7 units up on the map.</p>	<p>6. NEIGHBORHOOD Refer to Exercise 5. In which quadrant is Delsin when he is done walking? Describe this quadrant.</p>

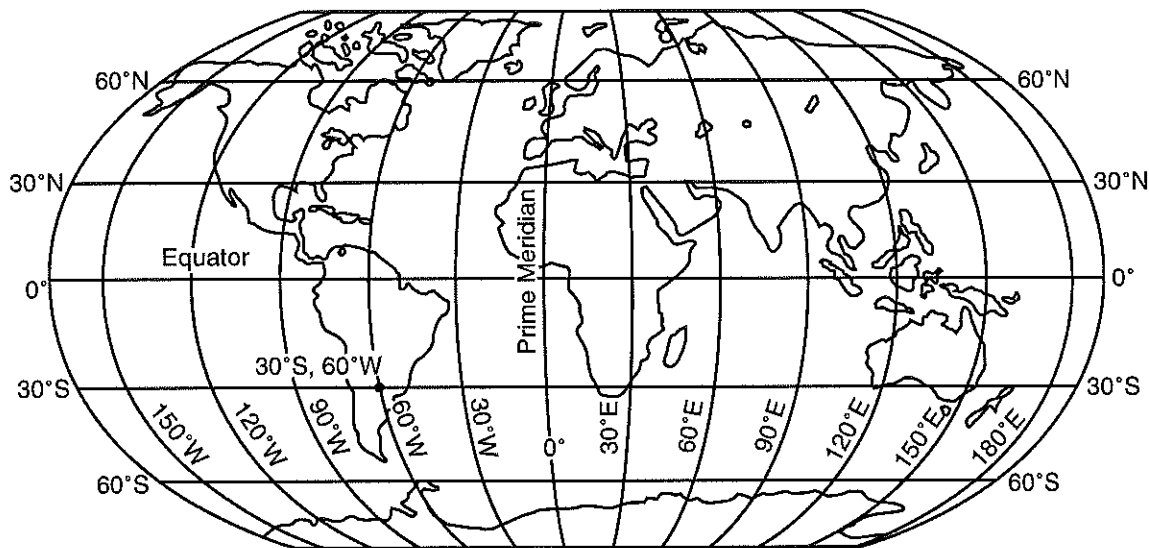
3-3

Enrichment

Latitude and Longitude

This world map shows some of the latitude and longitude lines. Latitude is measured in degrees north and south of the equator. Longitude is measured in degrees east and west of the prime meridian, a line passing through Greenwich, England. (Greenwich is a suburb of London.)

The latitude is usually given first. For example, the location of 30°S, 60°W is lower South America.



Name a place near each location. Use an atlas or other reference source to check your answers.

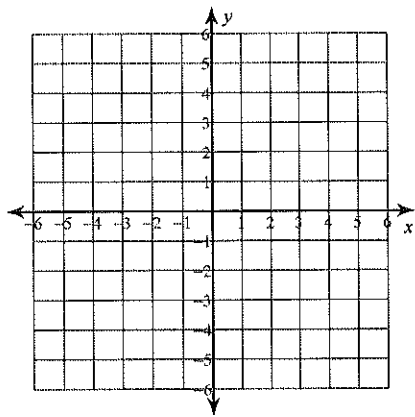
- | | | |
|----------------|-----------------|----------------|
| 1. 30°N, 30°W | 2. 30°S, 30°E | 3. 60°N, 120°W |
| 4. 15°N, 150°W | 5. 30°S, 140°E | 6. 25°N, 100°W |
| 7. 40°N, 120°W | 8. 45°N, 90°W | 9. 40°N, 5°W |
| 10. 60°N, 45°W | 11. 35°N, 140°E | 12. 0°, 60°E |

Lesson 3-3

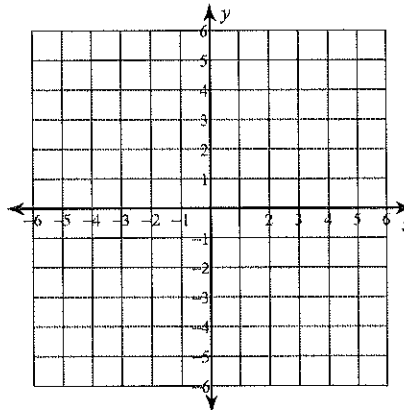
Graphing Lines in Slope-Intercept Form

Sketch the graph of each line.

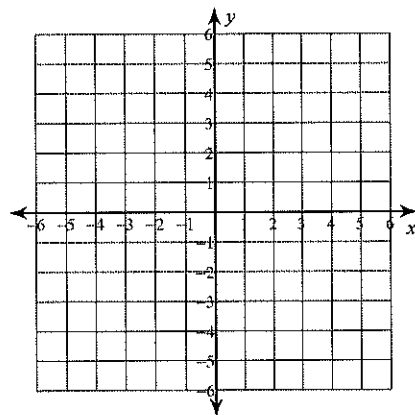
1) $y = \frac{1}{4}x - 1$



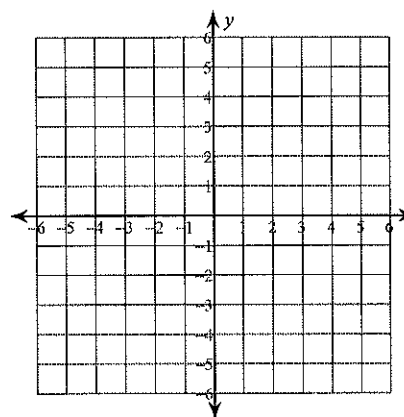
2) $y = -x + 2$



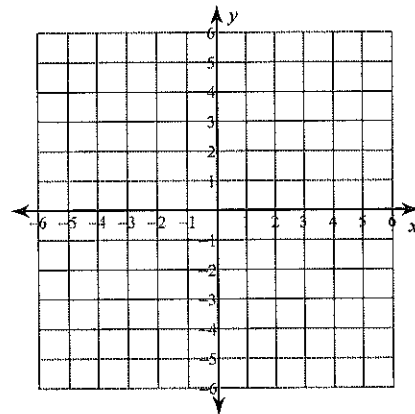
3) $y = x + 1$



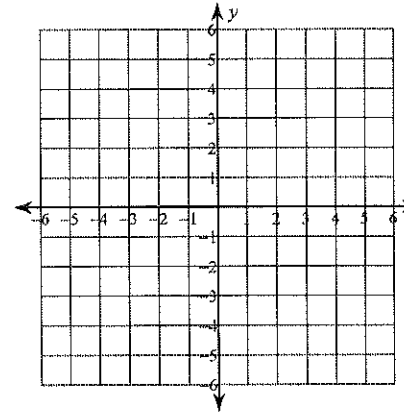
4) $y = \frac{4}{3}x - 4$



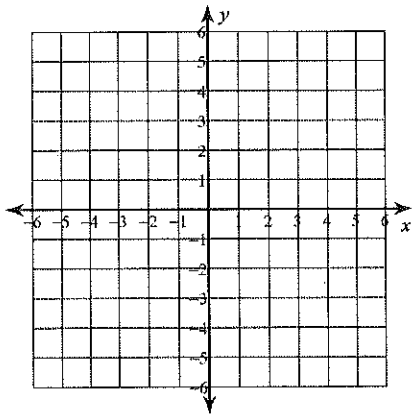
5) $y = -3x - 3$



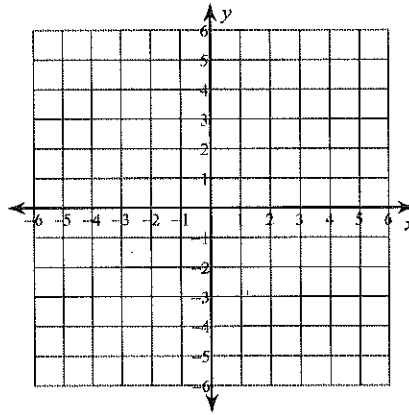
6) $y = 4$



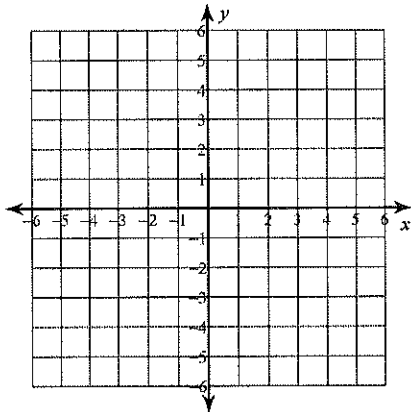
7) $y = \frac{3}{5}x - 1$



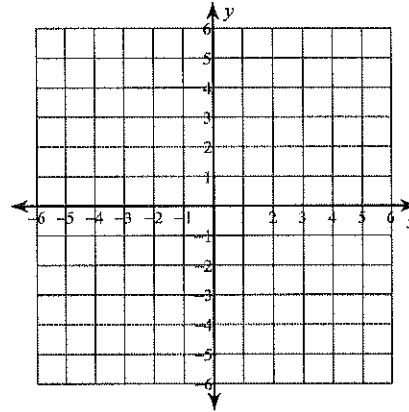
8) $x = 5$



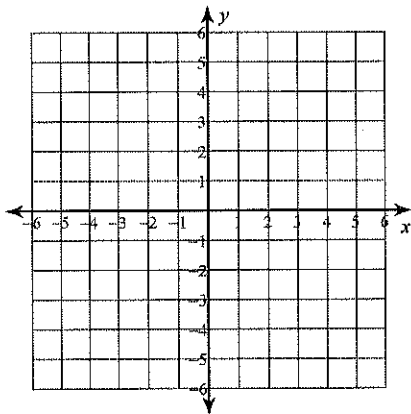
9) $y = 3$



10) $y = 3x - 2$



11) $y = 4x + 3$



12) $y = \frac{6}{5}x + 5$

