

NAME: _____
 DATE: _____

LESSON 9.3

GRAPHING A LINE PARALLEL TO AN AXIS

HOMEWORK ASSIGNMENT # 65: PAGES 353-354: # 2, 4, 8, 12, 16, 18 (A-C), 22

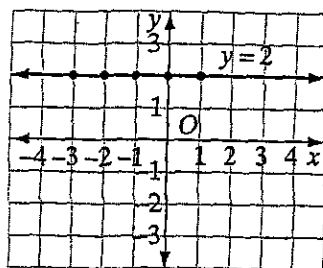
Lines Parallel to the x-Axis

An equation such as $y = 2$ can be graphed in the coordinate plane. Any pair of values whose y-coordinate is 2, no matter what the x-coordinate is, makes the equation $y = 2$ true. Therefore,

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

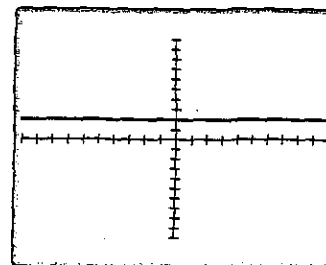
or any other pair $(a, 2)$ for all values of a , are points on the graph of $y = 2$. As shown at the right, the graph of $y = 2$ is a horizontal line parallel to the x-axis and 2 units above it.

The equation $y = 2$ defines a function and can be displayed on a graphing calculator. If there are other equations entered in the Y= menu, press **CLEAR** before entering the new equation.



ENTER: **Y=** 2 **GRAPH**

DISPLAY:



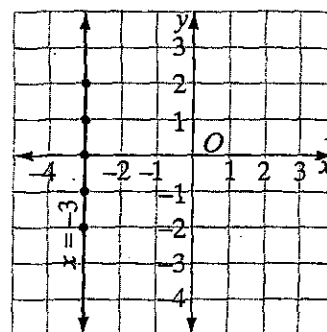
► The equation of a line parallel to the x-axis and b units from the x-axis is $y = b$. If b is positive, the line is above the x-axis, and if b is negative, the line is below the x-axis.

Lines Parallel to the y-Axis

An equation such as $x = -3$ can be graphed in the coordinate plane. Any pair of values whose x-coordinate is -3 , no matter what the y-coordinate is, makes the equation $x = -3$ true. Therefore,

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

or any other pair $(-3, b)$ for all values of b , are points on the graph of $x = -3$. As shown at the right, the graph of $x = -3$ is a vertical line parallel to the y-axis and 3 units to the left of it.



The equation $x = -3$ defines a relation that is not a function because it defines a set of ordered pairs but every ordered pair has the same first element. The method used to draw the graph of a function on a graphing calculator cannot be used to display this graph.

► The equation of a line parallel to the y-axis and a units from the y-axis is $x = a$. If a is positive, the line is to the right of the y-axis, and if a is negative, the line is to the left of the y-axis.

EXERCISES

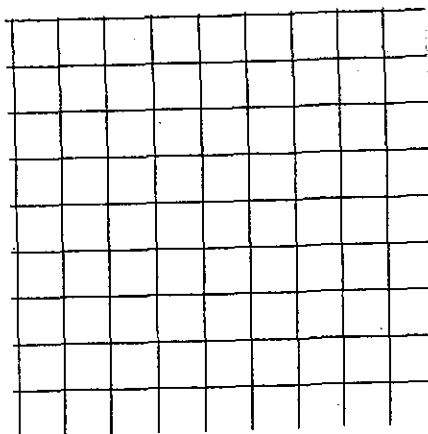
Writing About Mathematics

1. Mike said that the equation of the x -axis is $x = 0$. Do you agree with Mike? Explain why or why not.

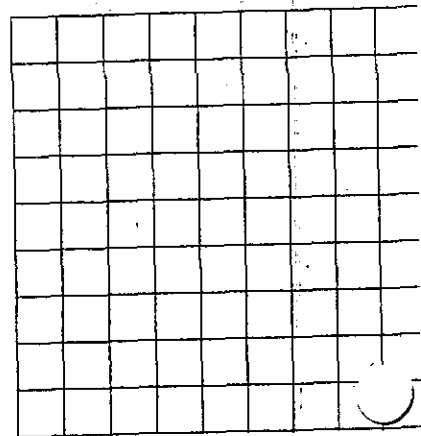
Developing Skills

In 3–17, draw the graph of each equation.

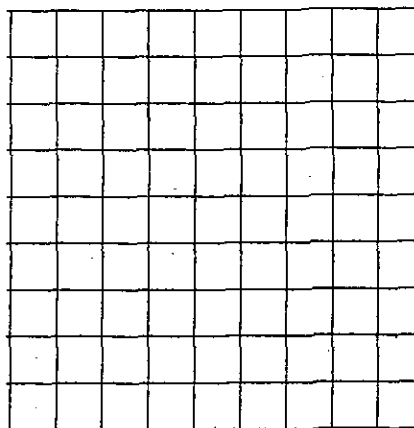
3. $x = 6$



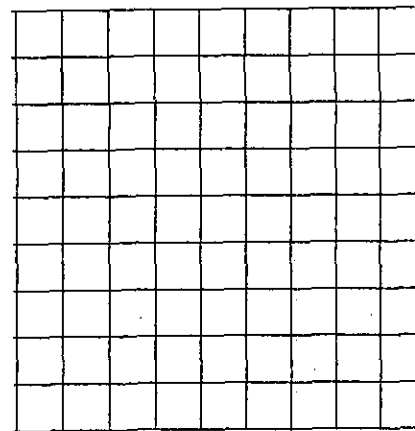
5. $x = 0$



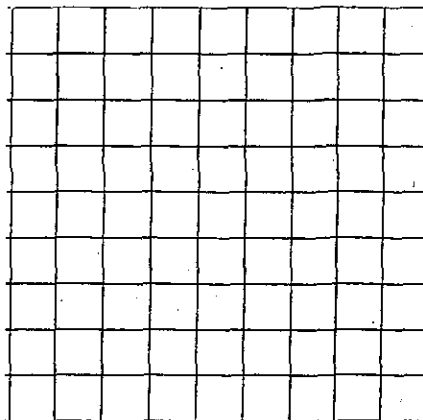
6. $x = -3$



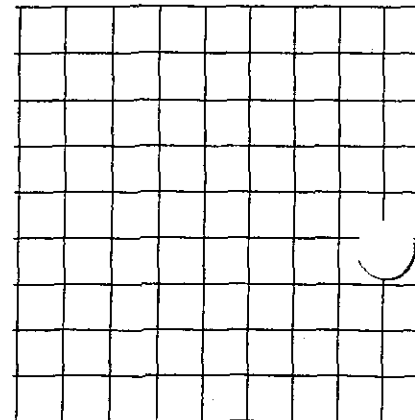
7. $x = -5$



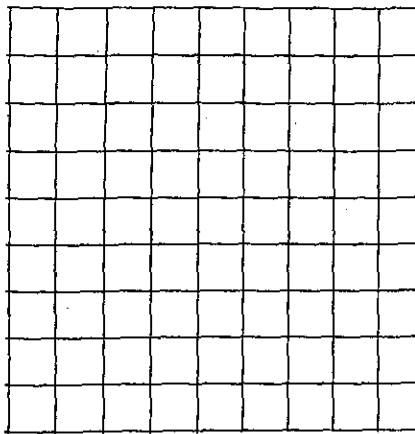
9. $y = 5$



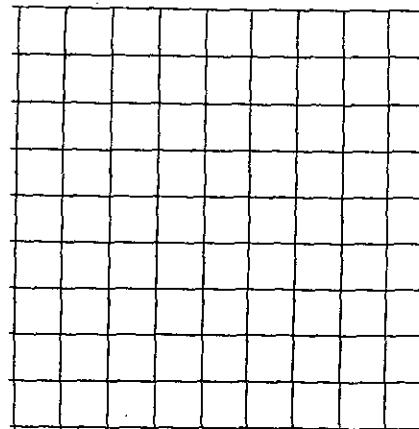
10. $y = 0$



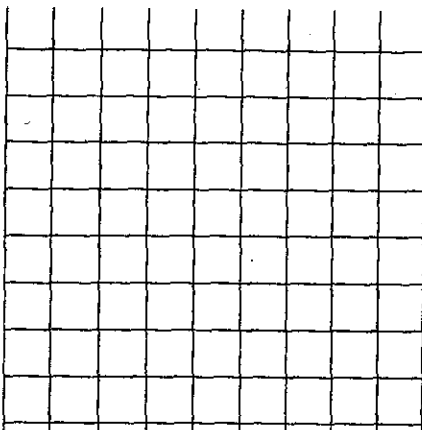
11. $y = -4$



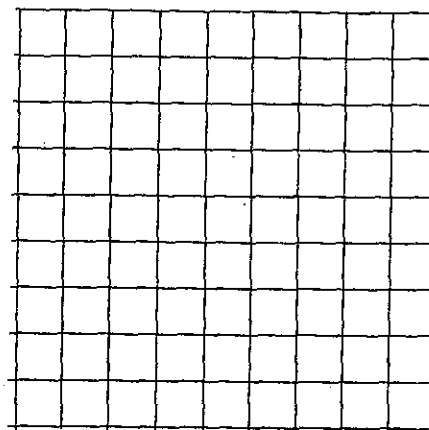
13. $x = \frac{1}{2}$



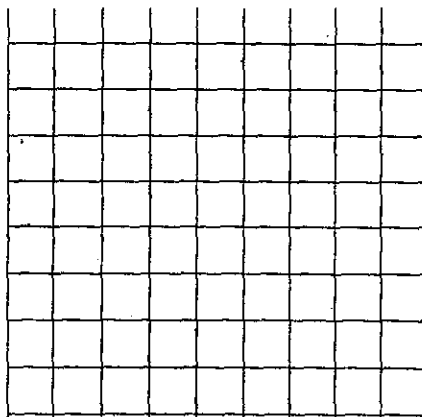
14. $y = 1\frac{1}{2}$



15. $y = -2.5$



17. $y = 3.5$



19. Write an equation of the line that is parallel to the y-axis

a. 3 units to the right of the axis

b. 10 units to the right of the axis

c. $4\frac{1}{2}$ units to the left of the axis

d. 6 units to the left of the axis.

e. 2.5 units to the right of the axis.

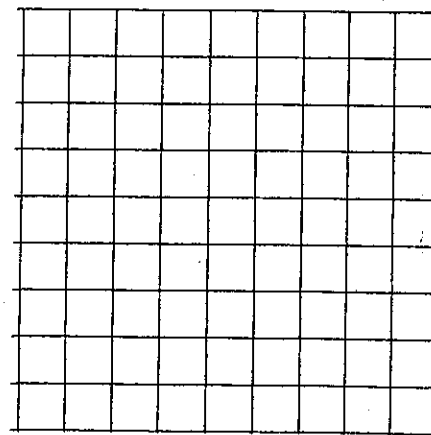
f. 5.2 units to the left of the axis.

20. Which statement is true about the graph of the equation $y = 6$?
- (1) It is parallel to the y -axis
 - (2) It is parallel to the x -axis.
 - (3) It is *not* parallel to either axis.
 - (4) It goes through the origin.
21. Which statement is *not* true about the graph of the equation $x = 5$?
- (1) It goes through $(5, 0)$.
 - (2) It is a vertical line.
 - (3) It is a function.
 - (4) It is parallel to the y -axis.

Applying Skills

23. The cost of admission to an amusement park on Family Night is \$25.00 for a family of any size.
- a. What is the cost of admission for the Gauger family of six persons?
 - b. Write an equation for the cost of admission, y , for a family of x persons.

24. The coordinates of the vertices of rectangle $ABCD$ are $A(-2, -1)$, $B(4, -1)$, $C(4, 5)$, and $D(-2, 5)$.
- a. Draw $ABCD$ on graph paper.
 - b. Write the equations of the lines $\overleftrightarrow{AB}$, $\overleftrightarrow{BC}$, $\overleftrightarrow{CD}$, and $\overleftrightarrow{DA}$.
 - c. Draw a horizontal line and a vertical line that separate $ABCD$ into four congruent rectangles.
 - d. Write the equations of the lines drawn in part c.



25. During the years 2004, 2005, and 2006, there were 5,432 AnyClothes stores.

a. Write a linear equation that gives the number of stores, y .

b. Predict the number of stores for the years 2007 and 2008.

26. During the years 1999 through 2006, SmallTown News' circulation was 74,000 each year.

a. Write a linear equation that gives the circulation, y .

b. Predict the circulation of SmallTown News in the years 2007 and 2008.

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INTEGRATED ALGEBRA 1
MR. THOMPSON

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EXERCISES

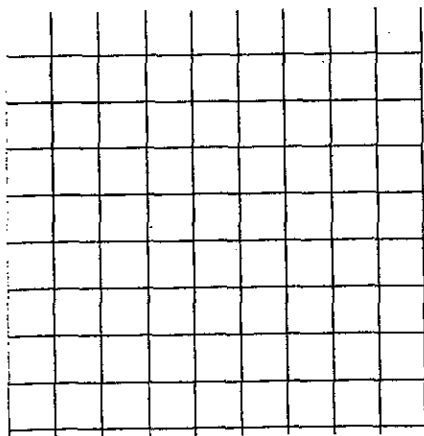
Writing About Mathematics

2. Does the line whose equation is $y = 4$ intersect the x -axis? Determine the coordinates of the point of intersection if one exists or explain why a point of intersection does not exist.

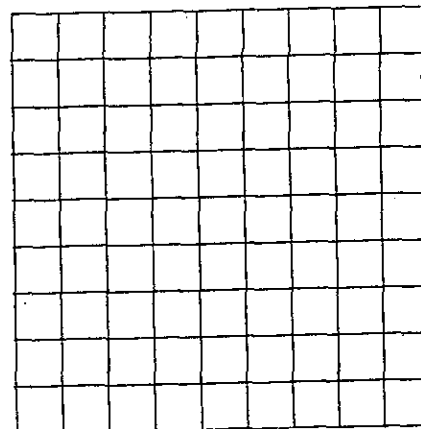
Developing Skills

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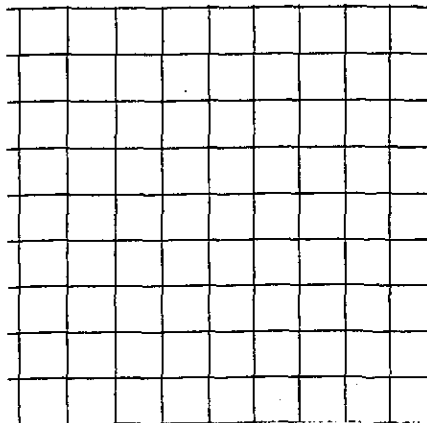
4. $x = 4$



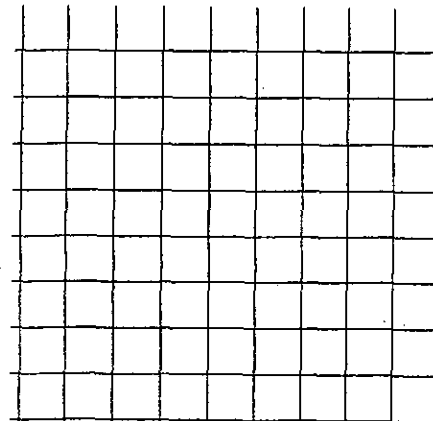
8. $y = 4$



12. $y = -7$



16. $x = -\frac{3}{2}$



18. Write an equation of the line that is parallel to the x -axis

a. 1 unit above the axis.

b. 5 units above the axis.

c. 4 units below the axis.

d. 8 units below the axis.

e. 2.5 units above the axis.

f. 3.5 units below the axis.

22. Which statement is true about the graph of the equation $y = x$?

(1) It is parallel to the y -axis.

(3) It goes through $(2, -2)$.

(2) It is parallel to the x -axis.

(4) It goes through the origin.

