Section 5.R.7 The Cartesian Coordinate System

Go to Section 5.R.7 Learn mode in Hawkes to follow along!

Equations in Two Variables

Descartes based his system on a relationship between _____ in a plane and _____of real numbers.

In the ordered pair (x, y), x is called the _____ and y is called the _____ _____.

In an ordered pair of the form (x, y), the _____ is called the **independent variable** and the _____ is called the **dependent variable**.

Plotting Ordered Pairs

The Cartesian coordinate system relates algebraic equations and ordered pairs to geometry. In this system, two number lines intersect at right angles and separate the plane into four _____. The **origin**, designated by the ordered pair $(0, 0)$, is _____. The horizontal number line is called the _____ or _____. The vertical number line is called the _____ or _____.

One-to-One Correspondence

_____

_____

Example 1 Plotting Ordered Pairs

Plot (or graph) the set of ordered pairs.

$$\{A(-2,1), B(-2,-4), C(0,4), D(1,3), E(2,-5)\}$$

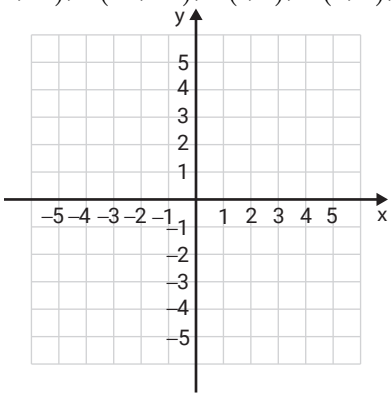
Note: The listing of ordered pairs within the braces can be in any order.

Solution

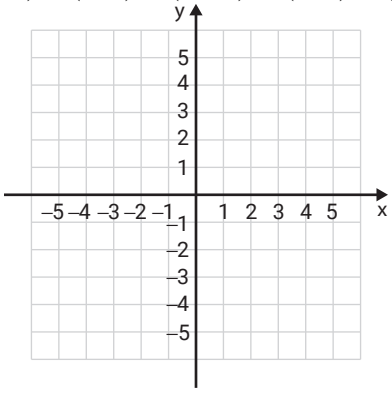
Exercises

Plot each set of ordered pairs and label the points.

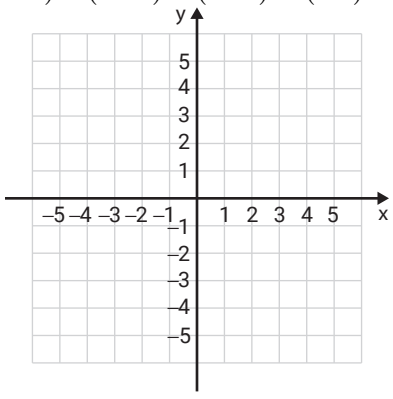
1. $\{A(-1,-1), B(-3,-2), C(1,3), D(0,0), E(2,5)\}$



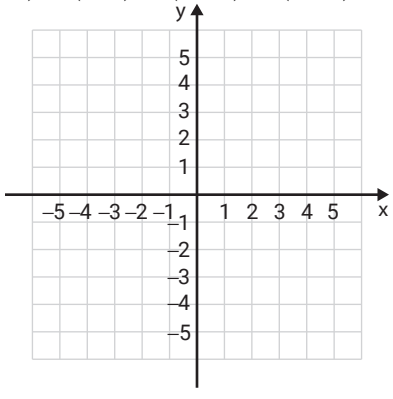
2. $\{A(1,2), B(0,2), C(-1,2), D(2,2), E(-3,2)\}$



3. $\{A(-1,4), B(0,-3), C(2,-1), D(4,1), E(-1,-1)\}$



4. $\{A(1,0), B(3,0), C(-2,1), D(-1,1), E(0,0)\}$



Finding Ordered Pairs that Satisfy Linear Equations

Example 3 Finding Ordered Pairs

Find the missing coordinates in the ordered pairs so that each point will satisfy the equation $2x + 3y = 12$.

$$(0, \quad), (3, \quad), (\quad, 0), (\quad, -2)$$

Solution

Exercises

Determine the missing coordinate in each of the ordered pairs so that the point will satisfy the equation given.

5. $x - y = 4$

- **a.** $(0, \_\_)$
- **b.** $(2, \_\_)$
- **c.** $(\ \_\_, 0)$
- **d.** $(\ \_\_, -3)$

6. $x + y = 7$

- **a.** $(0, \ \_\_)$
- **b.** $(-1, \_\_)$
- **c.** $(\ \_\_, 0)$
- **d.** $(\ \_\_, 3)$

7. $x + 2y = 6$

- **a.** $(0, \ \_\_)$
- **b.** $(2, \ \_\_)$
- **c.** $(\ \_\_, 0)$
- **d.** $(\_\_, 4)$

8. $3x + y = 9$

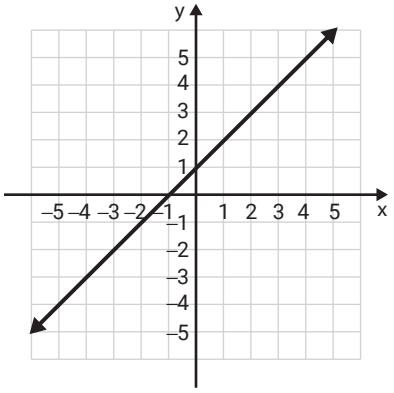
- **a.** $(0, \ \_\_)$
- **b.** $(4, \_\_)$
- **c.** $(\ \_\_, 0)$
- **d.** $(\ \_\_, 3)$

Identifying Points on a Graph

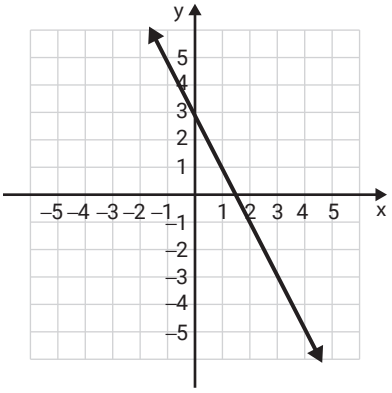
Example 6 Locating Points on the Graph of a Line

The graphs of two lines are given. Each line contains an infinite number of points. Use the grid to help you locate (or estimate) three points on each line.

a.



b.

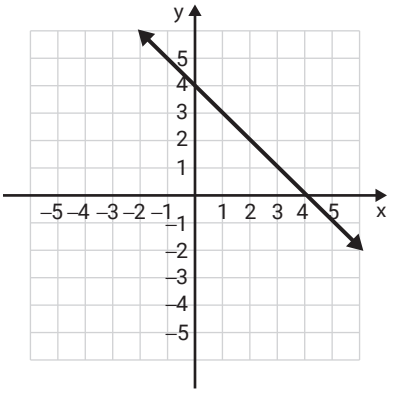


Solution

Exercises

The graph of a line is shown. List any three points on each line. (There is more than one correct answer.)

9.



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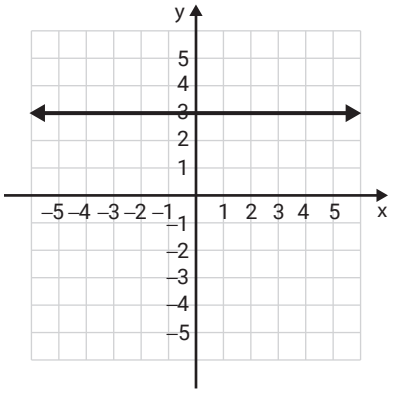
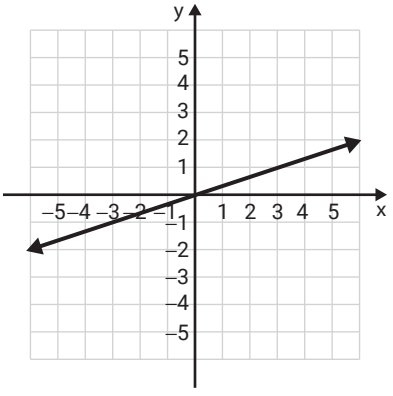


10.



12.