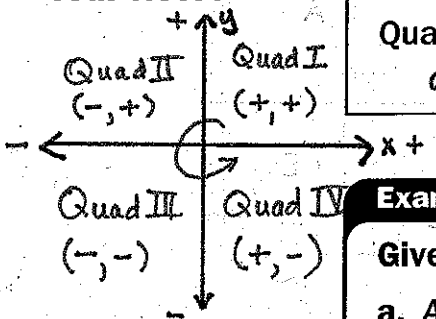
4.1 Plot Points in a Coordinate Plane

Goal • Identify and plot points in a coordinate plane.

Coordinate plane

Your Notes



VOCABULARY

Quadrant - one of 4 parts into which the axes divide the coordinate plane

Example 1 ***Name points in a coordinate plane***

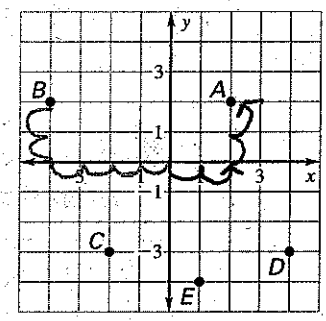
Give the coordinates of the point.

a. *A* **b.** *B*

Solution

a. Point *A* is 2 units to the right of the origin and 2 units up.
The *x*-coordinate is 2.
The *y*-coordinate is 2.
The coordinates are (2, 2).

b. Point *B* is 4 units to the left of the origin and 2 units up.
The *x*-coordinate is −4.
The *y*-coordinate is 2.
The coordinates are (−4, 2).



Points in Quadrant I have two positive coordinates. Points in the other three quadrants have at least one negative coordinate.

Checkpoint **Complete the following exercise.**

1. Use the coordinate plane in Example 1 to give the coordinates of points *C*, *D*, and *E*.

C (−2, −3)
D (4, −3)
E (1, −4)

Your Notes

Example 2 ***Plot points in a coordinate plane***

Plot the point in a coordinate plane. Describe the location of the point.

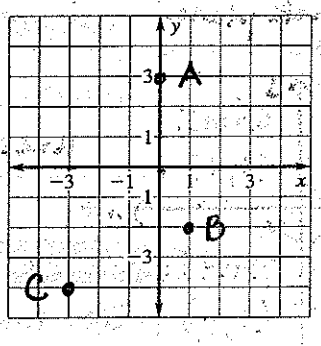
a. $A(0, 3)$ **b.** $B(1, -2)$ **c.** $C(-3, -4)$

Solution

a. Begin at the origin.
Move 3 units up.
Point *A* is on the y-axis.

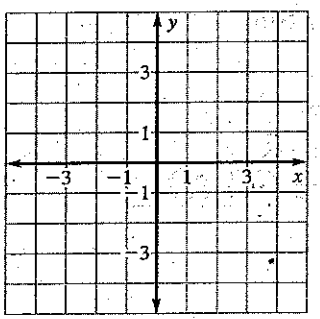
b. Begin at the origin.
Move 1 unit to the right.
Move 2 units down.
Point *B* is in Quadrant IV.

c. Begin at the origin
Move 3 units to the left.
Move 4 units down.
Point *C* is in Quadrant III.

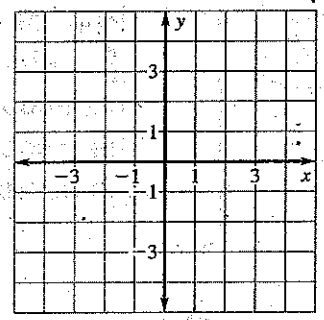


Checkpoint **Plot the point in a coordinate plane. Describe the location of the point.**

2. $A(-4, -4)$



3. $B(2, 0)$



Your Notes

Example 3 ***Graph a function***

set of inputs

Graph the function $y = x + 1$ with domain $-2, -1, 0, 1, 2$. Then identify the range of the function.

Solution set of outputs

Step 1 Make a table.

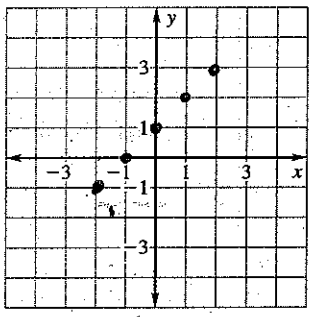
must show only 1 substitution per table - can show all.

x	$y = x + 1$
-2	$y = -2 + 1 = -1$
-1	$y = -1 + 1 = 0$
0	$y = 0 + 1 = 1$
1	$y = 1 + 1 = 2$
2	$y = 2 + 1 = 3$

Step 2 List the ordered pairs:

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

Then graph the function.

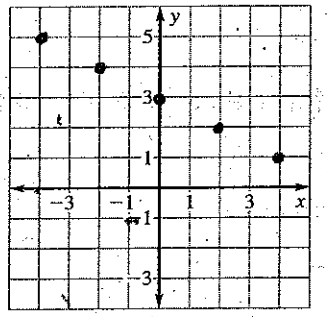


y's

Step 3 Identify the range: $\{-1, 0, 1, 2, 3\}$.

Checkpoint **Complete the following exercise.**

4. Graph the function $y = -\frac{1}{2}x + 3$ with domain $-4, -2, 0, 2$, and 4. Then identify the range.



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

$y = -\frac{1}{2}(-2) + 3$

$y = 1 + 3$

$y = 4$

$y = -\frac{1}{2}(0) + 3$

$= 0 + 3 = 3$

$y = -\frac{1}{2}(2) + 3$

$y = -1 + 3$

$y = 2$

R: $\{5, 4, 3, 2, 1\}$

Homework