GUIDED NOTES – 2.1 THE RECTANGULAR COORDINATE SYSTEM AND GRAPHS

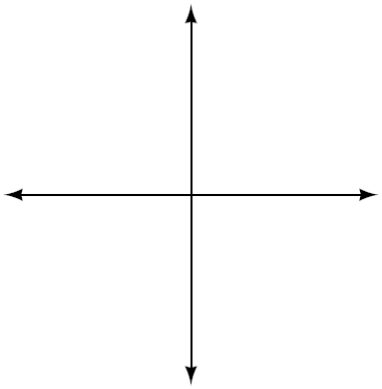
LEARNING OBJECTIVES

In this section, you will:

- Plot ordered pairs in a Cartesian coordinate system.
- Graph equations by plotting points.
- Find x-intercepts and y-intercepts.
- Use the distance formula.
- Use the midpoint formula.

PLOTTING ORDERED PAIRS IN THE CARTESIAN COORDINATE SYSTEM

- Label the quadrants in the figure on the right.

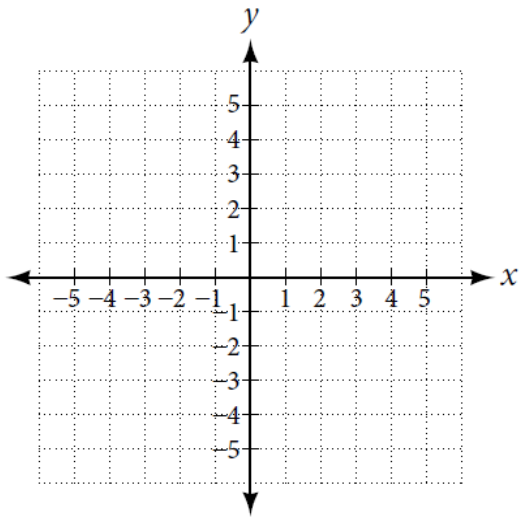


- Every point on the plane has a horizontal component, or x-coordinate, and a vertical component, or y-coordinate. Together, we write them as an _____ of the form (x, y).
- The point at which the two axes cross is called the _____. Its coordinates are _____.

Study the box in your textbook section titled "Cartesian coordinate system."

Try It: Read Example 1 in the text, then answer the following.

Plot the points $(-2, -4)$, $(5, -1)$, and $(2, 0)$ in the plane to the right, along with arrows representing their horizontal and vertical displacements from the origin.



Homework: *You should now be ready to attempt problems 1-3 in "Homework – Algebra 2.1" on WeBWorK.*

GRAPHING EQUATIONS BY PLOTTING POINTS

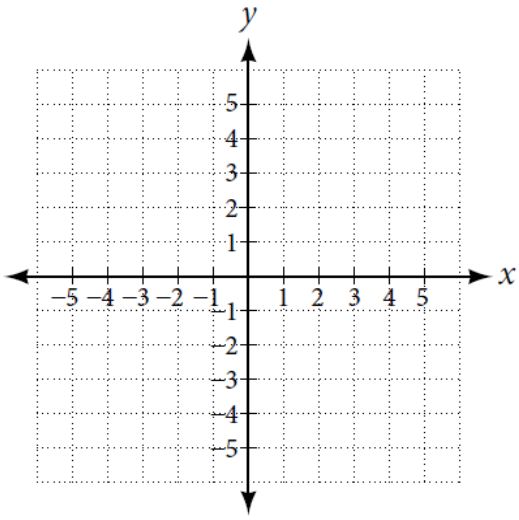
- What is meant by an *equation in two variables*?

Try It: Read Example 2 in the text, then answer the following.

Fill in the table and graph the equation by plotting points:

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

x	$y = \frac{1}{2}x + 2$	(x, y)
-4		
-2		
0		
2		
4		



Homework: *You should now be ready to attempt problems 4-5 in "Homework – Algebra 2.1" on WeBWorK.*

FINDING x-INTERCEPTS AND y-INTERCEPTS

Study the box in your textbook section titled "given an equation, find the intercepts."

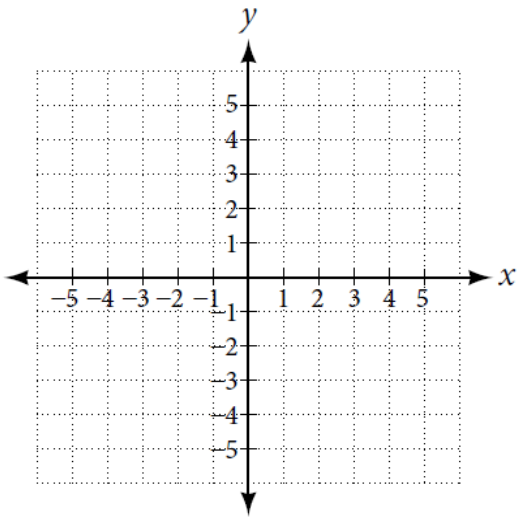
- Describe how to find the intercepts of the graph of an equation:
  - x-intercept:

  - y-intercept:

Try It: Read Example 4 in the text, then answer the following.

Find the intercepts of the equation and sketch the graph:

$$y = -\frac{3}{4}x + 3.$$



Homework: *You should now be ready to attempt problems 6-8 in "Homework – Algebra 2.1" on WeBWorK.*

USING THE DISTANCE FORMULA

Study the box in your textbook section titled "the distance formula."

- Give the formula for the distance between the two points (x_1, y_1) and (x_2, y_2):

Try It: Read Example 5 in the text, then answer the following.

Find the distance between the two points $(1, 4)$ and $(11, 9)$.

USING THE MIDPOINT FORMULA

- Give the formula for finding the midpoint of a line segment with endpoints (x_1, y_1) and (x_2, y_2).

Try It: Read Example 7 in the text, then answer the following.

Find the midpoint of the line segment with endpoints $(-2, -1)$ and $(-8, 6)$.

Homework: *You should now be ready to attempt problems 9-12 in "Homework – Algebra 2.1" on WeBWorK.*

REVIEW QUESTIONS

Answer the following questions in your own words.

1. Is it possible for a point plotted in the Cartesian coordinate system to *not* lie in one of the four quadrants? Explain.

2. When using the distance formula, explain the correct order of operations that are to be performed to obtain the correct answer.