

Study Skills in Action

Reading Your Textbook Like a Manual

Many students avoid opening their textbooks for the same reason many people avoid opening their checkbooks—*anxiety and frustration*. The truth? Not opening your math textbook will cause more anxiety and frustration! Your textbook is a manual designed to help you master skills and understand and remember concepts. It contains many features and resources that can help you be successful in your course.

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4.2 Graphs of Equations in Two Variables

(1) Sketch graphs of equations using the point-plotting method. Find and use *x*- and *y*-intercepts as aids to sketching graphs. Use the verbal problem-solving method to write an equation and sketch its graph.

The Graph of an Equation in Two Variables
The solutions of an equation involving two variables can be represented by points on a rectangular coordinate system. The set of all such points is called the **graph** of the equation.

The Point-Plotting Method of Sketching a Graph

- If possible, rewrite the equation by isolating one of the variables.
- Make a table of values showing several solution points.
- Plot these points on a rectangular coordinate system.
- Connect the points with a smooth curve or line.

(2) **EXAMPLE 1** Sketching the Graph of an Equation
Sketch the graph of $3x + y = 5$.

SOLUTION
Begin by solving the equation for *y*, so that *y* is isolated on the left.
 $3x + y = 5$ Write original equation.
 $y = -3x + 5$ Subtract 3*x* from each side.

Next, create a table of values, as shown below.

<i>x</i>	-2	-1	0	1	2	3
<i>y</i> = -3 <i>x</i> + 5	11	8	5	2	-1	-4
Solution point	(-2, 11)	(-1, 8)	(0, 5)	(1, 2)	(2, -1)	(3, -4)

Now, plot the solution points. It appears that all six points lie on a line, so complete the sketch by drawing a line through the points.

(3) **Exercises Within Reach**
Solutions in English & Spanish and tutorial videos at AlgebraWithinReach.com

Sketching the Graph of an Equation In Exercises 1 and 2, complete the table and use the results to sketch the graph of the equation. See Additional Answers.

1. $y = 9 - x$

<i>x</i>	-2	-1	0	1	2
<i>y</i>	10	9	8	7	6

2. $y = x - 1$

<i>x</i>	-2	-1	0	1	2
<i>y</i>	-3	-2	-1	0	1

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4 Chapter Summary

(5) **What did you learn?** **Explanation and Examples** **Review Exercises**

(6)

4.1	Determine whether ordered pairs are solutions of equations (p. 177).	To verify that an ordered pair (x, y) is a solution of an equation with variables <i>x</i> and <i>y</i> , use the following steps: 1. Substitute the values of <i>x</i> and <i>y</i> into the equation. 2. Simplify each side of the equation. 3. If each side simplifies to the same number, then the ordered pair is a solution. If the two sides yield different numbers, then the ordered pair is not a solution.	1-8
4.2	Use the verbal problem-solving method to plot points on a rectangular coordinate system (p. 175).	Construct a verbal model and assign labels to write an equation for a real-life problem. Use the equation to construct a table of values. Plot the ordered pairs represented by the table of values.	9-16
4.2	Sketch graphs of equations using the point-plotting method (p. 176).	1. If possible, rewrite the equation by isolating one of the variables. 2. Make a table of values showing several solution points. 3. Plot these points on a rectangular coordinate system. 4. Connect the points with a smooth curve or line.	17, 18
4.2	Find and use <i>x</i> - and <i>y</i> -intercepts as aids to sketching graphs (p. 175).	To find the <i>x</i> -intercept(s), let <i>y</i> = 0 and solve the equation for <i>x</i> . To find the <i>y</i> -intercept(s), let <i>x</i> = 0 and solve the equation for <i>y</i> .	19-30
4.2	Use the verbal problem-solving method to write an equation and sketch its graph (p. 180).	Construct a verbal model and assign labels to write an equation for a real-life problem. Sketch a graph of the equation.	31-36
4.3	Identify the domain and range of a relation (p. 184).	A relation is any set of ordered pairs. The set of first components in the ordered pairs in the domain of the relation. The set of second components in the range of the relation.	37, 38
4.3	Determine whether relations are functions (p. 185).	A function is a relation in which no two ordered pairs have the same first component and different second components.	39-42
4.3	Use function notation and evaluate functions (p. 187).	The function $y = 2x - 6$ can be given the name " <i>f</i> " and written in function notation as $f(x) = 2x - 6$.	43-48
4.3	Identify the domain and range of a function (p. 186).	The domain of a function may be explicitly described along with the function, or it may be implied by the context.	49-54
			55-58

Smart Study Strategy

Use the Features of Your Textbook

To review what you learned in a previous class:

- Read the list of skills you should learn (1) at the beginning of this section. If you cannot remember how to perform a skill, review the appropriate example (2) in the section.
- Read and understand the contents of all tinted concept boxes (3)—these contain important definitions and rules.

To prepare for homework:

- Complete a few of the exercises (4) following each example. If you have difficulty with any of these, reread the example or seek help from a peer or instructor.

To review for quizzes and tests:

- Make use of the Chapter Summary (5). Check off the concepts (6) you know, and review those you do not know.
- Complete the Review Exercises. Then take the Mid-Chapter Quiz, Chapter Test, or Cumulative Test, as appropriate.