

# Chapter 7      Systems of Equations and Inequalities

Course Number

Instructor

Date

## Section 7.1 Solving Systems of Equations

**Objective:** In this lesson you learned how to solve a system of equations by substitution and by graphing and how to use systems of equations to model and solve real-life problems.

### Important Vocabulary

Define each term or concept.

**Systems of equations**

**Solution of a system of equations** (in two variables)

**Method of substitution**

**Point of intersection**

**Break-even point**

### I. The Method of Substitution (Pages 488–492)

To check that the ordered pair  $(-3, 4)$  is the solution of a system of equations, . . .

List the steps necessary for solving a system of equations using the method of substitution.

### *What you should learn*

How to use the method of substitution to solve systems of equations in two variables and how to solve systems of equations graphically

Explain what is meant by back-substitution.

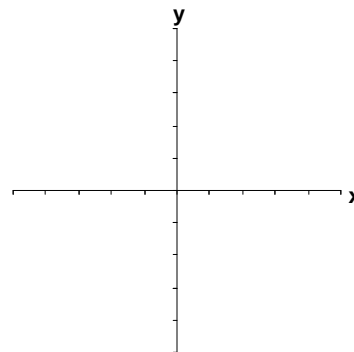
**Example 1:** Solve the system of equations using the method of substitution.

$$\begin{cases} 2x + y = 2 \\ x - 2y = -9 \end{cases}$$

To use a graphing utility to solve a system of equations graphically, . . .

**Example 2:** Solve the system of equations graphically.

$$\begin{cases} x^2 - y = 5 \\ -x + y = -3 \end{cases}$$



**II. Applications of Systems of Equations** (Pages 493–494)

The total cost  $C$  of producing  $x$  units of a product typically has two components: \_\_\_\_\_.

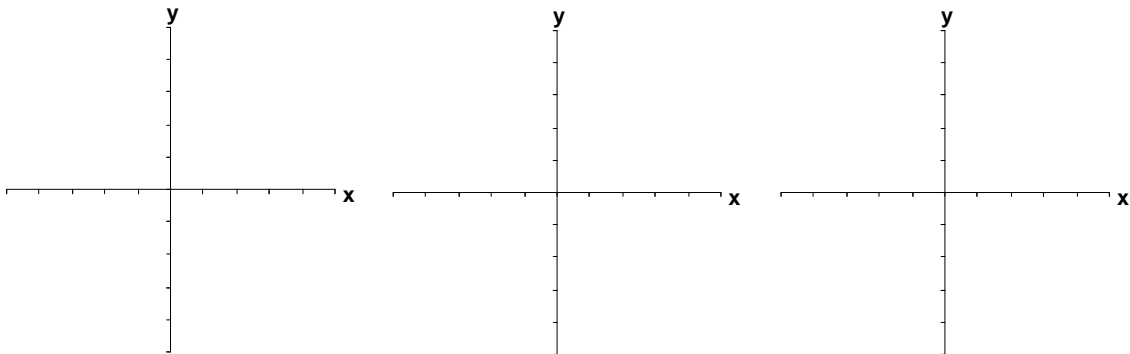
In break-even analysis, the break-even point corresponds to the \_\_\_\_\_ of the cost and revenue curves.

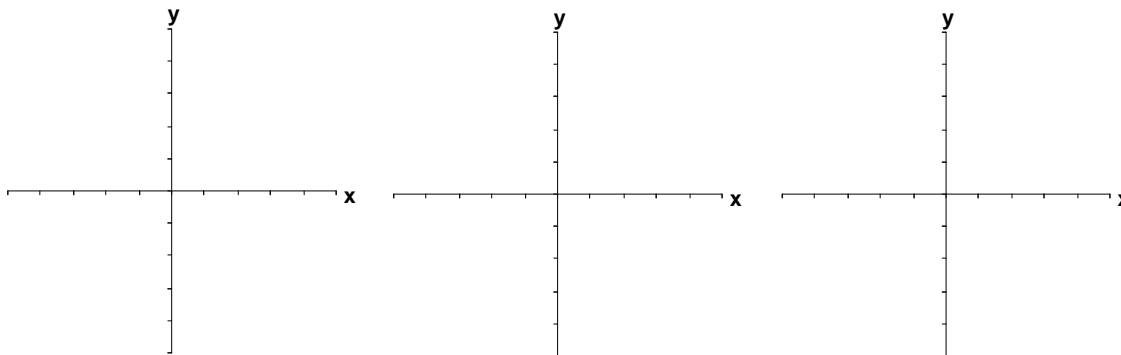
Break-even analysis can also be approached from the point of view of profit. In this case, consider the profit function, which is \_\_\_\_\_. The break-even point occurs when profit equals \_\_\_\_\_.

**Example 3:** The cost of producing  $x$  units is  $C = 1.5x + 15,000$  and the revenue obtained by selling  $x$  units is  $R = 5x$ . How many items should be sold to break even?

***What you should learn***

How to use systems of equations to model and solve real-life problems



**Additional notes****Homework Assignment**

Page(s)

Exercises