# Chapter 7 Linear Systems and Matrices

Course Number

Instructor

Date

## Section 7.1 Solving Systems of Equations

**Objective:** In this lesson you learned how to solve systems 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 Methods of Substitution and Graphing
(Pages 474–478)

***What you should learn***
How to use the methods of substitution and graphing to solve systems of equations in two variables

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

List the steps necessary for solving a system of two equations in $x$ and $y$ using the method of substitution.

The solution of a system of equations corresponds to the _____ of the graphs of the equations in the system.

To use the method of graphing to solve a system of two equations in $x$ and $y$, perform the following steps . . .

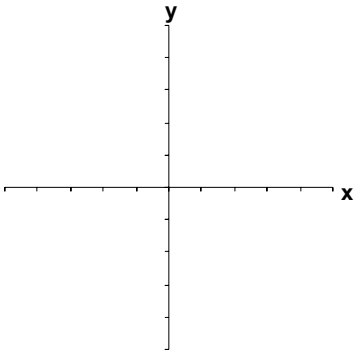
Explain what is meant by back-substitution.

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

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

**Example 2:** Solve the system of equations using the method of graphing.

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




**II. Points of Intersection and Applications** (Pages 479–480)

***What you should learn***
How to use systems of equations to model and solve real-life problems

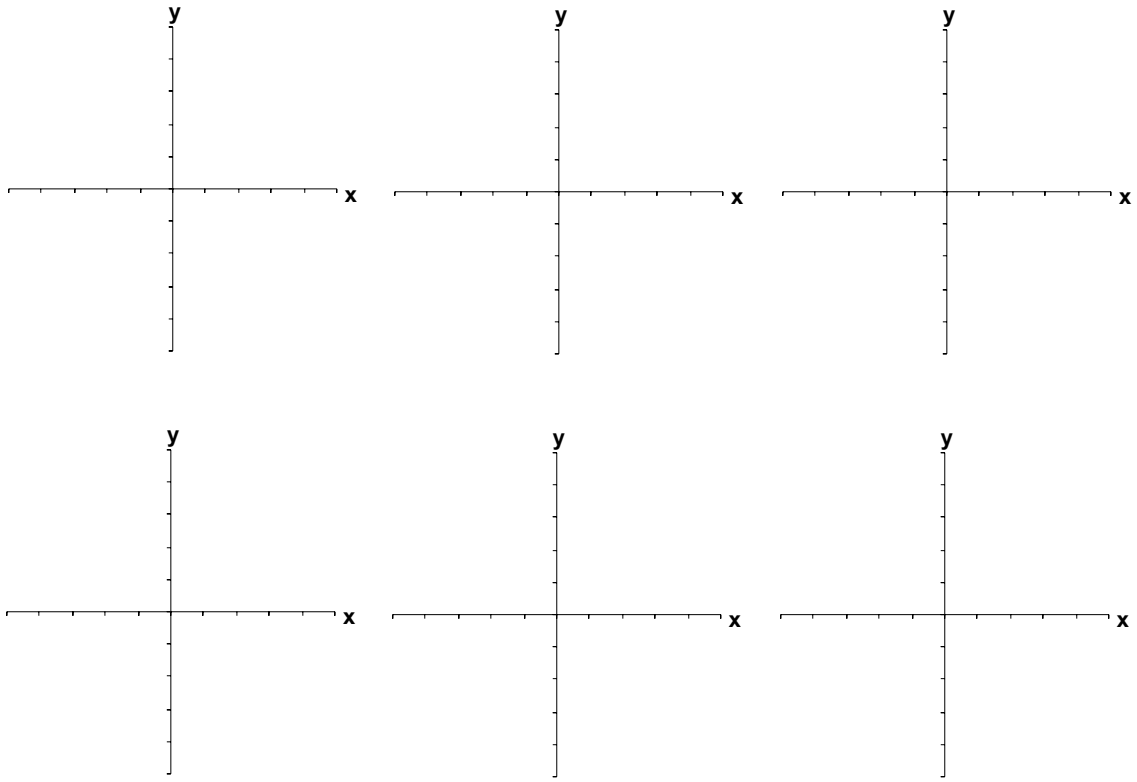
The total cost $C$ of producing $x$ units of a product typically has two components: _____.

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?

**Additional notes**




**Homework Assignment**

Page(s)

Exercises