# 6-5 Notes: Applying Systems of Linear Equations

**Determine The Best Method** You have learned five methods for solving systems of linear equations: graphing, substitution, elimination using addition, elimination using subtraction, and elimination using multiplication. For an exact solution, an algebraic method is best.

**Example : At a baseball game, Henry bought 3 hotdogs and a bag of chips for $14. Scott bought 2 hotdogs and a bag of chips for $10. Each of the boys paid the same price for their hotdogs, and the same price for their chips. The following system of equations can be used to represent the situation. Determine the best method to solve the system of equations. Then solve the system.**

$3x + y = 14$
$2x + y = 10$

## Exercises

**Determine the best method to solve each system of equations. Then solve the system.**

**1.** $5x + 3y = 16$
$3x - 5y = -4$

**2.** $3x - 5y = 7$
$2x + 5y = 13$

**3.** $y = -3x + 24$
$5x - y = 8$

**4.** $y = 2x - 4$
$y = -3x + 11$

**Apply Systems Of Linear Equations** When applying systems of linear equations to problem situations, it is important to analyze each solution in the context of the situation.

**Example : BUSINESS A T-shirt printing company sells T-shirts for $15 each. The company has a fixed cost for the machine used to print the T-shirts and an additional cost per T-shirt. Use the table to estimate the number of T-shirts the company must sell in order for the income to equal expenses.**

| T-shirt Printing Cost | |
|---|---|
| | |
| | |

**Understand**

**Plan**

**Solve** Let $x$ = let $y$ =.

| total amount | initial amount | rate of change times number of T-shirts sold |
|---|---|---|

income

expenses

## Exercises

**Refer to the example above. If the costs of the T-shirt company change to the given values and the selling price remains the same, determine the number of T-shirts the company must sell in order for income to equal expenses.**

**1.** printing machine: $5000.00;
T-shirt: $10.00 each

**2.** printing machine: $2100.00;
T-shirt: $8.00 each

**3.** printing machine: $8800.00;
T-shirt: $4.00 each

**4.** printing machine: $1200.00;
T-shirt: $12.00 each