

# Algebra I

## Notes Section 6.2

### Solve Linear Systems by Substitution

#### Big Ideas

1. How to find the solution of a linear system by substituting an expression for one variable in an equation into the other equation and then solving for the other variable.

#### STEPS

- 1) Solve an equation for a single positive variable.
- 2) Substitute this expression into the other equation and then solve.
- 3) Substitute this value into the first equation and then solve again.
- 4) Write your answers as an ordered pair.

#### EXAMPLE 1 Solve.

a)  $y = 3x + 2$   
 $x + 2y = 11$

b)  $y = 2x + 5$   
 $3x + y = 10$

$$\begin{aligned} \text{c) } x - y &= 3 \\ x + 2y &= -6 \end{aligned}$$

**EXAMPLE 2** Solve.

$$\begin{aligned} \text{a) } x - 2y &= -6 \\ 4x + 6y &= 4 \end{aligned}$$

$$\begin{aligned} \text{b) } 3x + y &= -7 \\ -2x + 4y &= 0 \end{aligned}$$

**EXAMPLE 3** Solve.

$$y = 21.95x + 10$$

$$y = 22.45x$$

**EXAMPLE 4** For extremely cold temperatures, an automobile manufacturer recommends that a 70% antifreeze and 30% water mix be used in the cooling system of a car. How many quarts of pure (100%) antifreeze and a 50% antifreeze and 50% water mix should be combined to make 11 quarts of a 70% antifreeze and 30% water mix?