3.2 Solve Linear Systems Algebraically

pp. 160–167

EXAMPLE

Solve the system using the elimination method.

$2x + 5y = 8$ Equation 1
$4x + 3y = -12$ Equation 2

Multiply Equation 1 by -2 so that the coefficients of x differ only in sign.

$2x + 5y = 8$ $\xrightarrow{\times -2}$ $-4x - 10y = -16$

$4x + 3y = -12$ $\longrightarrow$ $4x + 3y = -12$

Add the revised equations and solve for y.

$-7y = -28$

$y = 4$

Substitute the value of y into one of the original equations and solve for x.

$2x + 5(4) = 8$ Substitute 4 for y in Equation 1.

$2x = -12$ Subtract 5(4) = 20 from each side.

$x = -6$ Divide each side by 2.

▶ The solution is $(-6, 4)$.

EXERCISES

EXAMPLES 2 and 3 on p. 161–162 for Exs. 7–10

Solve the system using the elimination method.

7. $3x + 2y = 5$
$-2x + 3y = 27$

8. $3x + 5y = 5$
$2x - 3y = 16$

9. $2x + 3y = 9$
$-3x + y = 25$

10. FUEL COSTS The cost of 14 gallons of regular gasoline and 10 gallons of premium gasoline is \$46.68. Premium costs \$.30 more per gallon than regular. What is the cost per gallon of each type of gasoline?

3.3 Graph Systems of Linear Inequalities

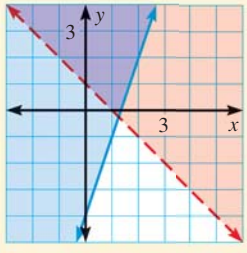
pp. 168–173

EXAMPLE

Graph the system of linear inequalities.

$3x - y \leq 4$ Inequality 1
$x + y > 1$ Inequality 2

Graph each inequality in the system. Use a different color for each half-plane. Then identify the region that is common to both graphs. It is the region that is shaded purple.



EXERCISES

EXAMPLE 1 on p. 168 for Exs. 11–13

Graph the system of linear inequalities.

11. $4x + y < 1$
$-x + 2y \leq 5$

12. $2x + 3y > 6$
$2x - y \leq 8$

13. $x + 3y \geq 5$
$-x + 2y < 4$