SYSTEMS OF LINEAR EQUATIONS

Example 1

Find the point of intersection for $y = 5x + 1$ and $y = -3x - 15$.

Substitute the equal parts of the equations.

$$5x + 1 = -3x - 15$$

Solve for x.

$$8x = -16$$

$$x = -2$$

Replace x with -2 in either original equation and solve for y.

$$y = 5(-2) + 1 \qquad y = -3(-2) - 15$$

$$y = -10 + 1 \quad \text{or} \quad y = 6 - 15$$

$$y = -9 \qquad y = -9$$

The two lines intersect at $(-2, -9)$.

Problems

Find the point of intersection (x, y) for each system of linear equations.

1. $y = x - 6$
   $y = 12 - x$

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

3. $y = 2x + 16$
   $y = 5x + 4$

4. $y = 3x - 5$
   $y = 2x + 14$

5. $y = x + 7$
   $y = 4x - 5$

6. $y = 7 - 3x$
   $y = 2x - 8$

Answers

1. $(9, 3)$
2. $(4, 7)$
3. $(4, 24)$
4. $(19, 52)$
5. $(4, 11)$
6. $(3, -2)$