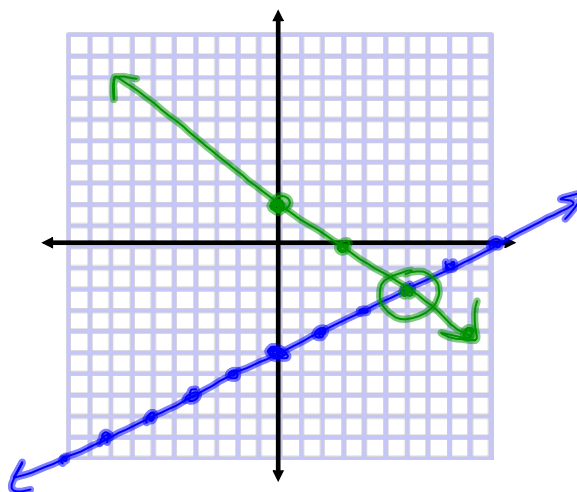# Solving Systems of Equations

Ex. 1   Solve the system of equations by graphing.

$$y = \tfrac{1}{2}x - 5$$
$$y = -\tfrac{2}{3}x + 2$$

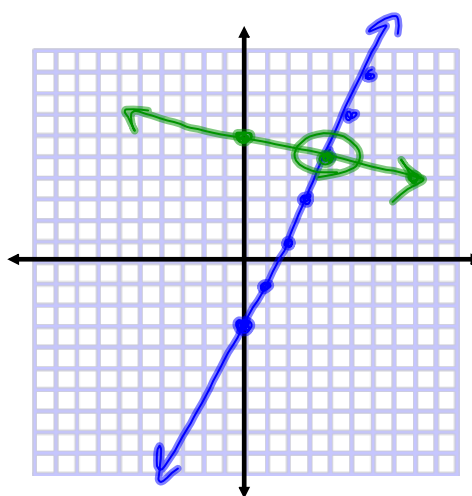$(6, -2)$

Ex. 2   Solve the system of equations by graphing.

$$y = 2x - 3$$
$$y = -\tfrac{1}{4}x + 6$$

$(4, 5)$

Ex. 3   Solve the system of equations.

$$y = 3x$$

$$2x + y = 15$$

$$2x + 3x = 15$$

$$\frac{5x}{5} = \frac{15}{5}$$

$$x = 3$$

$$y = 3 \cdot 3$$

$$y = 9$$

$$(3, 9)$$

Ex. 4   Solve the system of equations.

$$y = 4x$$

$$3x + 2y = 88$$

$$3x + 2(4x) = 88$$

$$3x + 8x$$

$$11x = 88$$

$$x = 8$$

$$y = 4 \cdot 8$$

$$y = 32$$

$$(8, 32)$$

Ex. 5   Solve the system of equations.

$3x + y = 13$

$5x - y = 27$

$\dfrac{8x}{8} = \dfrac{40}{8}$

$x = 5$

$3 \cdot 5 + y = 13$

$15 + y = 13$

$y = -2$

$(5, -2)$

Ex. 6   Solve the system of equations.

$-2x + 5y = 18$

$2x - 3y = -10$

$2y = 8$

$y = 4$

$-2x + 5 \cdot 4 = 18$

$-2x + 20 = 18$

$-2x = -2$

$x = 1$

$(1, 4)$

Ex. 7   Solve the system of equations.

$4x + 5y = 9$ $\longrightarrow$ $4x + 5y = 9$

$2(-2x + 3y = -11)$ $\longrightarrow$ $-4x + 6y = -22$

$11y = -13$

$y = -\dfrac{13}{11}$

Ex. 8   Solve the system of equations.

$7x + 6y = 17$

$2x - 3y = 19$

Ex. 9   Solve the system of equations.

$3 \left(2x + 5y = 31 \right) \longrightarrow 6x + 15y = 93$

$2 \left(3x - 2y = 18 \right) \longrightarrow -6x + 4y = -36$

$$19y = 57$$

$$y = 3$$

$3x - 2 \cdot 3 = 18$

$3x - 6 = 18$

$3x = 24 \quad x = 8$ $(8, 3)$

Ex. 10   Solve the system of equations.

$7x + 4y = 50$

$2x - 5y = -41$

Ex. 11   Solve the system of inequalities.

$$y < \frac{1}{2}x - 7$$

$$y \geq -3x + 5$$

$<$ dashed, below

$>$ dashed, above

$\leq$ solid, below

$\geq$ solid, above