

Bell Work

Find the solutions by factoring.

$$x^2 - 2x - 1 = -2x + 3$$

A system of nonlinear equations is a system in which at least one of the equations is nonlinear.

Solve the system by graphing.

$$y = x^2 - 2x - 1$$

$$y = -2x - 1$$

Solve the system by graphing.

$$y = x^2 - 4x - 2$$

$$y = x - 2$$

Solve the system by graphing.

$$y = \frac{1}{2}x^2 - 2x + 4$$

$$x + y = 3$$

Solve the system by substitution.

$$\begin{aligned}x^2 + x - y &= -1 \\x + y &= 4\end{aligned}$$

Solve the system by substitution.

$$\begin{aligned}x^2 + 3x + y &= 0 \\2x + y &= 5\end{aligned}$$

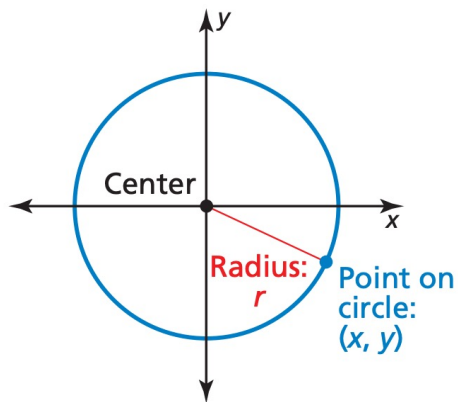
Solve the system by elimination.

$$\begin{aligned}2x^2 + 4x - y &= -2 \\x^2 + y &= 2\end{aligned}$$

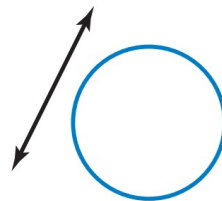
Solve the system by elimination.

$$y = -x^2 + 4$$

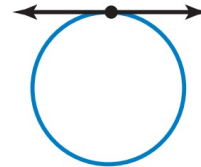
$$y = -4x + 8$$



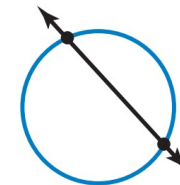
An equation of the form $x^2 + y^2 = r^2$ is the standard form of a circle with center $(0, 0)$ and radius r . When a nonlinear system consists of the equation of a circle and a linear equation, the graphs can intersect in zero, one, or two points. So, the system can have zero, one, or two real solutions, as shown.



No real solution



One real solution



Two real solutions

Solve the system involving circles with substitution.

$$\begin{aligned}x^2 + y^2 &= 10 \\y &= -3x + 10\end{aligned}$$