

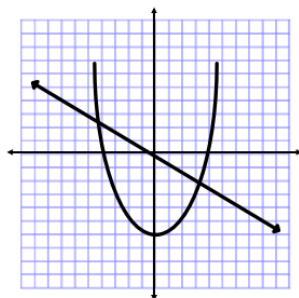
9.8 Systems of Linear and Quadratic Equations

Objective:

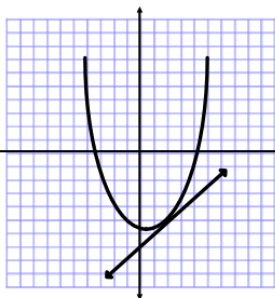
- SW solve systems of linear and quadratic equations.

You can solve systems of linear and quadratic equations graphically and algebraically. This type of system can have:

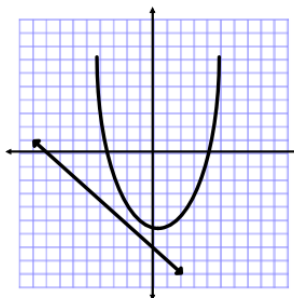
two solutions



one solution



no solution

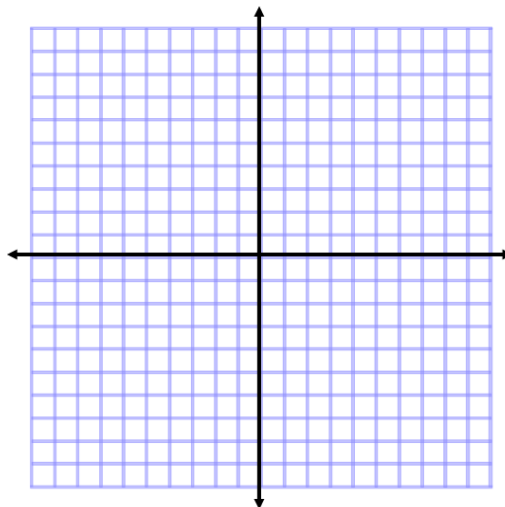


I. Graphing

What are the solutions of the system?

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

$$y = x - 2$$



Now, let's try using graphing calculators!

$$y_1 = x^2 - 4x + 4$$

$$y_2 = x - 2$$

II. Substitution

What are the solutions of the system?

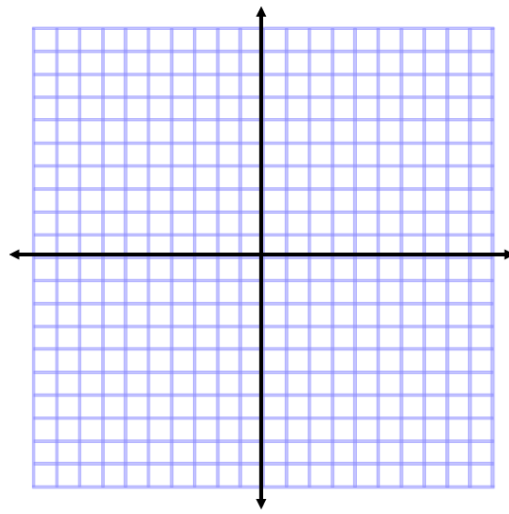
$$y = x^2 - 4x + 4$$

$$y = x - 2$$

You try!

Find the solutions by graphing.

1. $y = -x^2 + 9$
 $y = 2x + 6$



Find the solutions by graphing calculator.

2. $y = 2x^2 + 1$
 $y = -2x + 5$

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

Find the solutions by substitution.

4. $y = x^2 - 6x + 10$
 $y = 4 - x$

5. $y - 30 = 12x$
 $y = x^2 + 11x - 12$

III. Word problem application

Since opening day, attendance at Pool A has increased steadily while attendance at Pool B first rose then fell. Equations modeling the daily attendance (y) and number of days since opening day (x) are shown below.

Pool A: $y = 28x + 4$

Pool B: $y = -x^2 + 39x + 64$

1. On what day(s) was the attendance the same at both pools?

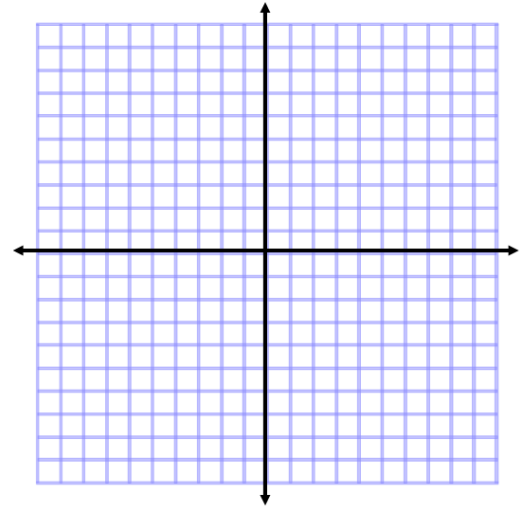
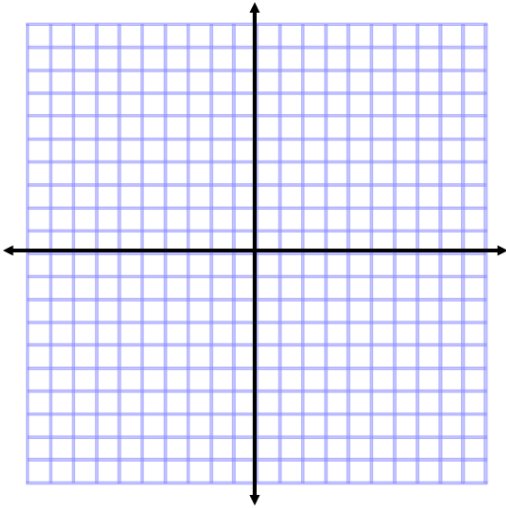
2. What was the attendance?

Practice Problems:

Solve by graphing.

1. $y = x^2 + 2x + 1$
 $y = x + 1$

2. $y = x^2 + 2x + 5$
 $y = -2x + 1$



Solve by graphing calculator. You may have to Zoom In to see the intersection points. Remember to get back to standard axes press [zoom][6].

3. $y = 3x + 4$
 $y = -x^2 + 4$

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

5. $y = 4 - .5x$
 $y = -x^2 + 2$

6. $y = -x^2 + 4x - 3$
 $y = 1$

Solve by substitution.

9. $y = x^2 - 2x - 6$
 $y = 4x + 10$

10. $y = 3x - 20$
 $y = -x^2 + 34$

11. $y = x^2 + 5x + 5$
 $y - x = 1$

12. $y = 3x^2 + 21x - 5$
 $-10x + y = -1$

13. The equations below model the numbers of two portable music players sold (y) and days after both players were introduced (x).

Music Player A: $y = 191x - 32$

Music Player B: $y = -x^2 + 200x + 20$

a) On what day(s) did the company sell the same number of each player?

b) How many players of each type were sold?

14. A student says that the system $y = x^2 + 2x + 4$ and $y = x + 1$ has one solution. Is the student right or wrong? Explain why and show all work.