

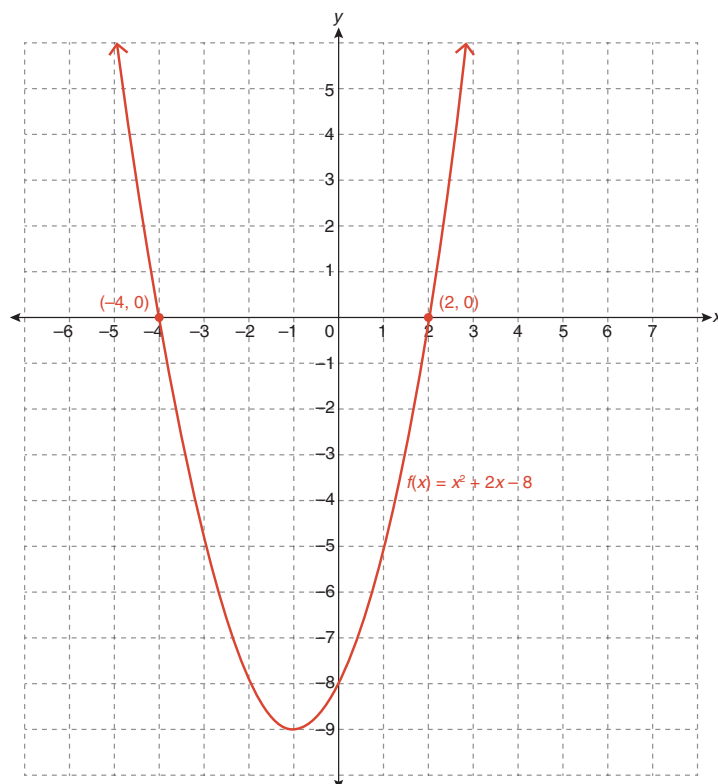
## Lesson 2.4: Quadratic Equations



## Practice Solutions – VI

1. Solve each equation by graphing the corresponding function.

a.  $x^2 - 8 = -2x$



Rearrange to make the equation equal to zero.

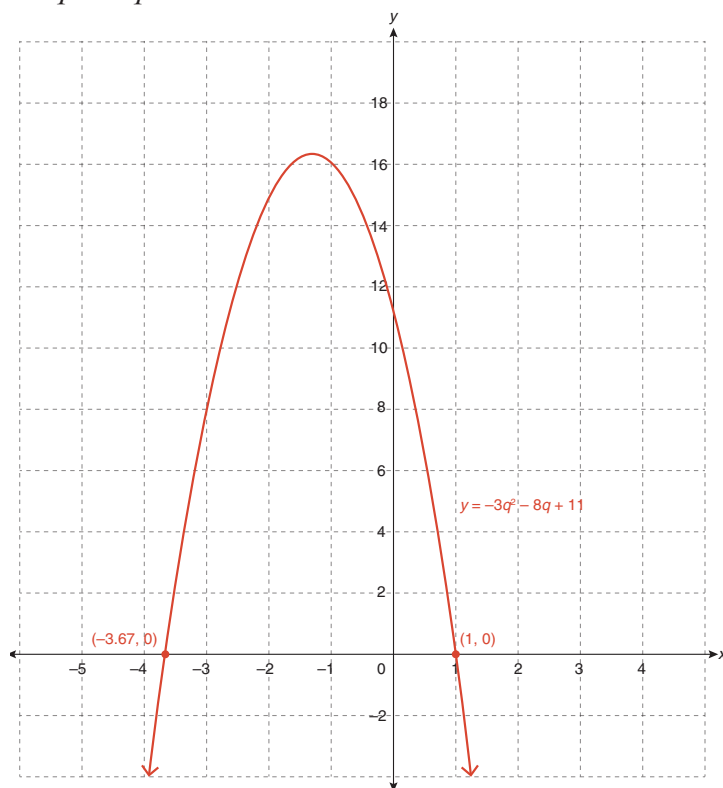
$$x^2 - 8 = -2x$$

$$x^2 + 2x - 8 = 0$$

Then, graph the corresponding function, and determine the zeros of the function, which are the  $x$ -intercepts of the graph.

The solutions to the equation are  $x = -4$  and  $x = 2$ .

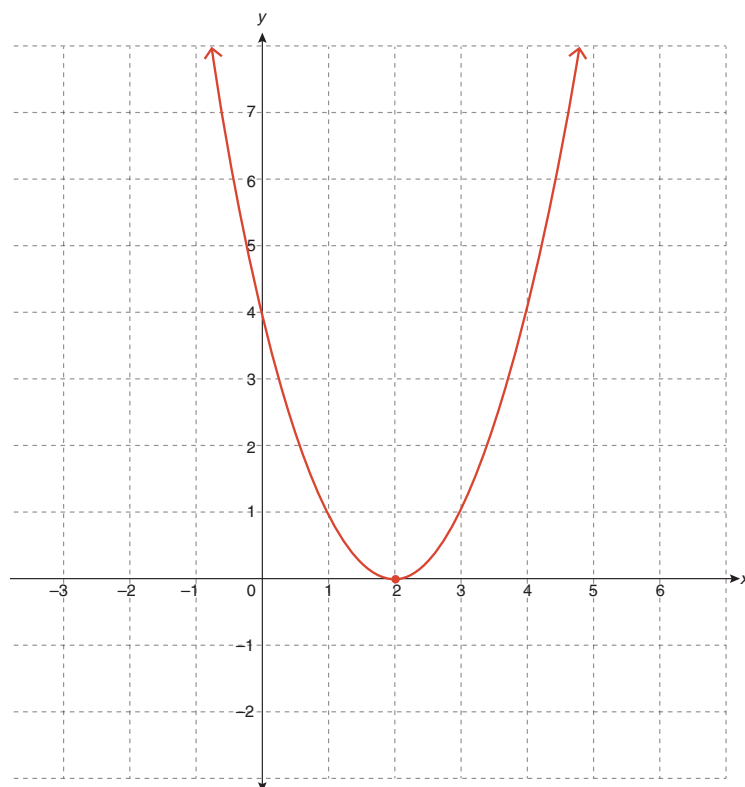
b.  $-3q^2 - 8q + 11 = 0$



Graph the corresponding function, and determine the zeros of the function, which are the  $x$ -intercepts of the graph.

The solutions to the equation are  $q \doteq -3.67$  and  $q = 1$ .

c.  $n^2 - 4n = -4$



Rearrange to make the equation equal to zero.

$$n^2 - 4n = -4$$

$$n^2 - 4n + 4 = 0$$

Then, graph the corresponding function, and determine the zeros of the function, which are the  $x$ -intercepts of the graph.

The solution to the equation is  $x = 2$ .

2. Solve each equation by factoring.

a.  $2s^2 + 12s + 18 = 0$

$$2s^2 + 12s + 18 = 0$$

$$2(s^2 + 6s + 9) = 0$$

$$2(s + 3)^2 = 0$$

$$s + 3 = 0$$

$$s = -3$$

The solution to the equation is  $s = -3$ .

b.  $\frac{1}{4}x^2 + \frac{5}{4}x = -1$

$$\frac{1}{4}x^2 + \frac{5}{4}x = -1$$

$$4\left(\frac{1}{4}x^2 + \frac{5}{4}x\right) = 4(-1)$$

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

$$x^2 + 5x + 4 = 0$$

$$(x + 4)(x + 1) = 0$$

$$x + 4 = 0 \quad x + 1 = 0$$

$$x = -4 \quad x = -1$$

The solutions to the equation are  $x = -4$  and  $x = -1$ .

c.  $2z^2 - 15 = -7z$

$$2z^2 - 15 = -7z$$

$$2z^2 + 7z - 15 = 0$$

$$2z^2 - 3z + 10z - 15 = 0$$

$$z(2z - 3) + 5(2z - 3) = 0$$

$$(2z - 3)(z + 5) = 0$$

$$2z - 3 = 0 \quad z + 5 = 0$$

$$2z = 3 \quad z = -5$$

$$z = \frac{3}{2}$$

The solutions to the equation are  $z = \frac{3}{2}$  and  $z = -5$ .

3. Solve each equation using square roots. Leave your answers as exact values.

a.  $-w^2 + 3 = -2$

$$-w^2 + 3 = -2$$

$$-w^2 = -5$$

$$w^2 = 5$$

$$w = \pm\sqrt{5}$$

The solutions to the equation are  $w = -\sqrt{5}$  and  $w = \sqrt{5}$ .

b.  $(x + 3)^2 = 7$

$$(x + 3)^2 = 7$$

$$x + 3 = \pm\sqrt{7}$$

$$x = -3 \pm \sqrt{7}$$

The solutions to the equation are  $x = -3 - \sqrt{7}$  and  $x = -3 + \sqrt{7}$ .

c.  $4(r + 6)^2 = 3$

$$4(r + 6)^2 = 3$$

$$(r + 6)^2 = \frac{3}{4}$$

$$r + 6 = \pm\sqrt{\frac{3}{4}}$$

$$r = -6 \pm \frac{\sqrt{3}}{2}$$

The solutions to the equation are  $r = -6 - \frac{\sqrt{3}}{2}$  and  $r = -6 + \frac{\sqrt{3}}{2}$ .

Please return to *Unit 2: Quadratic Functions and Equations Lesson 2.4* to continue your exploration.