Guided Practice 3.1.1

Example 1

Solve $2x^2 - 5 = 195$ for x.

1. Isolate x^2.

$2x^2 - 5 = 195$	Original equation
$2x^2 = 200$	Add 5 to both sides.
$x^2 = 100$	Divide both sides by 2.

2. Use a square root to find all possible solutions to the equation.

    Take the square root of both sides. Remember that both 10^2 and $(-10)^2$ equal 100, so there are two roots for this equation.

    $$x = \pm\sqrt{100} = \pm 10$$

    The equation $2x^2 - 5 = 195$ has two solutions, 10 and –10.

Example 2

Solve $4(x + 3)^2 - 10 = -6$ for x.

1. Isolate the squared binomial and take the square root of both sides of the equation.

$4(x + 3)^2 - 10 = -6$	Original equation
$4(x + 3)^2 = 4$	Add 10 to both sides.
$(x + 3)^2 = 1$	Divide both sides by 4.
$x + 3 = \pm\sqrt{1}$	Take the square root of both sides.
$x + 3 = \pm 1$	Simplify.

UNIT 3 • MODELING AND ANALYZING QUADRATIC FUNCTIONS
Lesson 1: Creating and Solving Quadratic Equations in One Variable

Instruction

2. Isolate x.

$x + 3 = \pm1$ Equation from the previous step

$x = -3 \pm 1$ Subtract 3 from both sides.

3. Separate the equation into two equations and solve.

$x = -3 + 1 = -2$

$x = -3 - 1 = -4$

The equation $4(x + 3)^2 - 10 = -6$ has two solutions, –2 and –4.

Example 3

Solve $(x - 1)^2 + 15 = -1$ for x.

1. Isolate the squared binomial.

$(x - 1)^2 + 15 = -1$ Original equation

$(x - 1)^2 = -16$ Subtract 15 from both sides.

2. Take the square root of both sides to isolate the binomial.

$(x - 1)^2 = -16$ Equation from the previous step

$x - 1 = \pm\sqrt{-16}$ Take the square root of both sides.

3. Determine the solution, if one exists.

There is a negative number under the radical, so the equation has no real solutions.

The equation $(x - 1)^2 + 15 = -1$ has no real solutions.