Review Exercise Set 2

Quadratic formula is $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Discriminant = $b^2 - 4ac$

Exercise 1: Use the discriminant to determine whether the following equation has 2 real number solutions, 1 real number solution, or no real number solutions (both solutions are imaginary).

$3x^2 + 2x + 4 = 0$

Exercise 2: Use the discriminant to determine whether the following equation has 2 real number solutions, 1 real number solution, or no real number solutions (both solutions are imaginary).

$x^2 - 11x + 30 = 0$

Exercise 3: Use the quadratic formula to solve the following equation.

$4x^2 + 11x = 3$

Exercise 4: Use the quadratic formula to solve the following equation.

$x^2 - x + 30 = 0$

Exercise 5: Use the quadratic formula to solve the following equation.

$2b^2 = 16 - 8b$

Review Exercise Set 2 Answer Key

Exercise 1: Use the discriminant to determine whether the following equation has 2 real number solutions, 1 real number solution, or no real number solutions (both solutions are imaginary).

$3x^2 + 2x + 4 = 0$

$a = 3, b = 2, c = 4$

$b^2 - 4ac = (2)^2 - 4(3)(4)$
$b^2 - 4ac = 4 - 48$
$b^2 - 4ac = -44$

Since the discriminant is negative, there will be no real number solutions to this quadratic equation. Both solutions would be imaginary numbers.

Exercise 2: Use the discriminant to determine whether the following equation has 2 real number solutions, 1 real number solution, or no real number solutions (both solutions are imaginary).

$x^2 - 11x + 30 = 0$

$a = 1, b = -11, c = 30$

$b^2 - 4ac = (-11)^2 - 4(1)(30)$
$b^2 - 4ac = 121 - 120$
$b^2 - 4ac = 1$

Since the discriminant is positive, there will be two real number solutions to this quadratic equation.

Exercise 3: Use the quadratic formula to solve the following equation.

$4x^2 + 11x = 3$

First, get all of the terms on the left side

$4x^2 + 11x - 3 = 0$

Exercise 3 (Continued):

Now, use the quadratic formula where a = 4, b = 11, c = -3

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(11) \pm \sqrt{(11)^2 - 4(4)(-3)}}{2(4)}$$

$$x = \frac{-11 \pm \sqrt{121 + 48}}{8}$$

$$x = \frac{-11 \pm \sqrt{169}}{8}$$

$$x = \frac{-11 \pm 13}{8}$$

$$x = \frac{-11 + 13}{8} \quad or \quad x = \frac{-11 - 13}{8}$$

$$x = \frac{2}{8} \qquad\qquad x = \frac{-24}{8}$$

$$x = \frac{1}{4} \qquad\qquad x = -3$$

Exercise 4: Use the quadratic formula to solve the following equation.

$x^2 - x + 30 = 0$

a = 1, b = -1, c = 30

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(-1) \pm \sqrt{(-1)^2 - 4(1)(30)}}{2(1)}$$

$$x = \frac{1 \pm \sqrt{1 - 120}}{2}$$

$$x = \frac{1 \pm \sqrt{-119}}{2}$$

$$x = \frac{1 \pm i\sqrt{119}}{2}$$

$$x = \frac{1 + i\sqrt{119}}{2} \quad or \quad x = \frac{1 - i\sqrt{119}}{2}$$

Exercise 5: Use the quadratic formula to solve the following equation.

$2b^2 = 16 - 8b$
$2b^2 + 8b - 16 = 0$

$a = 2,\ b = 8,\ c = -16$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-(8) \pm \sqrt{(8)^2 - 4(2)(-16)}}{2(2)}$$

$$x = \frac{-8 \pm \sqrt{64 + 128}}{4}$$

$$x = \frac{-8 \pm \sqrt{192}}{4}$$

$$x = \frac{-8 \pm 8\sqrt{3}}{4}$$

$$x = \frac{-8 + 8\sqrt{3}}{4} \quad or \quad x = \frac{-8 - 8\sqrt{3}}{4}$$

$$x = -2 + 2\sqrt{3} \qquad x = -2 - 2\sqrt{3}$$