

The Quadratic Formula and the Discriminant Assignment

Evaluate the discriminant of each equation and tell how many solutions each equation has and are the solutions real or imaginary.

1. $y = x^2 + 10x + 10$

discriminant:

Number of solutions:

Real or Imaginary:

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

discriminant:

Number of solutions:

Real or Imaginary:

3. $y = x^2 + 7x - 3$

discriminant:

Number of solutions:

Real or Imaginary:

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

discriminant:

Number of solutions:

Real or Imaginary:

5. $y = -2x^2 + 3x - 5$

discriminant:

Number of solutions:

Real or Imaginary:

6. $y = -5x^2 + 6x - 4$

discriminant:

Number of solutions:

Real or Imaginary:

Name: _____ Period: _____ Date: _____

The Quadratic Formula and the Discriminant Assignment

Solve each quadratic equation using the quadratic formula.

1. $x^2 - 15x + 56 = 0$

2. $3x^2 - 5x + 2 = 0$

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

4. $x^2 + 9x - 13 = 0$

The Quadratic Formula and the Discriminant Assignment

Evaluate the discriminant of each equation and tell how many solutions each equation has and are the solutions real or imaginary.

1. $y = x^2 + 10x + 10$

discriminant: $b^2 - 4ac = 10^2 - 4(1)(10) = 100 - 40 = 60$

Number of solutions: 2 since discriminant > 0

Real or Imaginary: Real

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

discriminant: $b^2 - 4ac = (-4)^2 - 4(4)(1) = 16 - 16 = 0$

Number of solutions: 1 since discriminant $= 0$

Real or Imaginary: Real

3. $y = x^2 + 7x - 3$

discriminant: $b^2 - 4ac = (7)^2 - 4(1)(-3) = 49 + 12 = 61$

Number of solutions: 2 since discriminant > 0

Real or Imaginary: Real

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

discriminant: $b^2 - 4ac = (3)^2 - 4(1)(4) = 9 - 16 = -7$

Number of solutions: 2 since discriminant < 0

Real or Imaginary: Imaginary

5. $y = -2x^2 + 3x - 5$

discriminant: $b^2 - 4ac = (3)^2 - 4(-2)(-5) = 9 - 40 = -31$

Number of solutions: 2 since discriminant < 0

Real or Imaginary: Imaginary

The Quadratic Formula and the Discriminant Assignment

6. $y = -5x^2 + 6x - 4$

discriminant: $b^2 - 4ac = (6)^2 - 4(-5)(-4) = 36 - 80 = -44$

Number of solutions: 2 since discriminant < 0

Real or Imaginary: Imaginary

Solve each quadratic equation using the quadratic formula.

1. $x^2 - 15x + 56 = 0$

Here $a = 1, b = -15, c = 56$

$$x = \frac{-(-15) \pm \sqrt{(-15)^2 - 4(1)(56)}}{2(1)}$$

$$x = \frac{+15 \pm \sqrt{225 - 224}}{2(1)}$$

$$x = \frac{+15 \pm 1}{2}$$

$$x = \frac{+15+1}{2} = 7 ; x = \frac{+15-1}{2} = 8$$

$$x = 7 ; x = 8$$

2. $3x^2 - 5x + 2 = 0$

Here $a = 3, b = -5, c = 2$

$$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(3)(2)}}{2(3)}$$

$$x = \frac{+5 \pm \sqrt{25 - 24}}{2(3)}$$

$$x = \frac{5 \pm 1}{6}$$

$$x = \frac{5+1}{6} = 1 ; x = \frac{5-1}{6} = \frac{2}{3}$$

$$x = 1 ; x = \frac{2}{3}$$

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

$$x^2 - 3x - 2 = 0$$

Here $a = 1, b = -3, c = -2$

$$x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(1)(-2)}}{2(1)}$$

$$x = \frac{+3 \pm \sqrt{9+8}}{2(1)}$$

$$x = \frac{+3 \pm \sqrt{17}}{2} ; x = \frac{+3+\sqrt{17}}{2} ; x = \frac{+3-\sqrt{17}}{2}$$

4. $x^2 + 9x - 13 = 0$

Here $a = 1, b = 9, c = -13$

$$x = \frac{-9 \pm \sqrt{9^2 - 4(1)(-13)}}{2(1)}$$

$$x = \frac{-9 \pm \sqrt{81+52}}{2(1)}$$

$$x = \frac{-9 \pm \sqrt{133}}{2}$$

$$x = \frac{-9+\sqrt{133}}{2} ; x = \frac{-9-\sqrt{133}}{2}$$