What is a Quadratic Equation?

Worksheet

A quadratic equation ax + bx + c = 0 is solved using the quadratic formula x = (b (b 4ac)) / 2a, which gives the two values of x (real or complex) that make the equation true.

ax^2 + bx + c = 0

Questions

1. What is the discriminant of x 5x + 6 = 0?

A) 1
B) 1
C) 25
D) 49

2. How many real roots does a quadratic have when the discriminant is negative?

A) Two
B) One
C) Zero (real) - two complex roots
D) Infinite

3. Solve x 9 = 0.

A) x = 3 only
B) x = 3
C) x = 9
D) No solution

4. In 3x 6x + 2 = 0, what is b?

A) 3
B) 6
C) 2
D) 6

5. Solve x 5x + 6 = 0 by factoring.

6. Solve 2x + 3x 2 = 0 using the quadratic formula.

7. Solve x + 4x + 4 = 0.

8. Define: What is the standard form of a quadratic equation?

9. Define: What is the quadratic formula?

10. Define: What does the discriminant (b 4ac) tell you?

Answer Key

1. A) 1 - b 4ac = 25 24 = 1.
2. C) Zero (real) - two complex roots - A negative discriminant means the roots are complex, not real.
3. B) x = 3 - x = 9 x = 3 or x = 3.
4. B) 6 - In ax + bx + c, b is the coefficient of x, which is 6.
5. Find two numbers that multiply to 6 and add to 5: 2 and 3 Factor: (x 2)(x 3) = 0 Set each factor to zero: x = 2 or x = 3
6. Identify a = 2, b = 3, c = 2 Discriminant: b 4ac = 9 (422) = 9 + 16 = 25 x = (3 25) / (22) = (3 5) / 4 x = 0.5 or x = 2
7. Identify a = 1, b = 4, c = 4 Discriminant: 16 16 = 0 (one repeated root) x = 4 / 2 = 2 (double root)
8. ax + bx + c = 0, where a 0.
9. x = (b (b 4ac)) / 2a
10. If positive: 2 real roots. If zero: 1 repeated root. If negative: 2 complex roots.