# How to find the number of solutions

Given a quadratic,

$$f(x) = ax^2 + bx + c$$

we are sometimes curious about how many solutions the quadratic will have, we can answer it by determining the discriminant. The **discriminant** is the following number,

$$d = b^2 - 4ac$$

After finding the discriminant, you can make the following conclusions,

- **IF** $d = 0$, the quadratic will have **one** solution. (Called a double-root)
- **ELSE IF** $d > 0$, the quadratic will have **two** different solutions.
- **ELSE IF** $d < 0$, the quadratic will have **NO** solutions.

## Practice Problems:

**Question 1.** Determine the number of solutions to the following functions,

(a) $f(x) = x^2 + 1$

(b) $g(x) = x^2 + 2x + 1$

(c) $f(x) = -3x^2 + x + 1$

(d) $r(x) = 2x^2 - 12x + 18$

**Question 2. Textbook, Pg 49** Question 6 a),b),c).