- **The solutions of the equation $ax^2 + bx + c = 0$ are given by the formula:**

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

Example 3

Solve $3x^2 - 7x - 1 = 0$ by using the formula.

$$x = \frac{-(-7) \pm \sqrt{(-7)^2 - 4(3)(-1)}}{2 \times 3}$$

$$x = \frac{7 \pm \sqrt{49 + 12}}{6}$$

$$x = \frac{7 \pm \sqrt{61}}{6}$$

Then $x = \frac{7 + \sqrt{61}}{6}$ or $x = \frac{7 - \sqrt{61}}{6}$

Or $x = 2.47$ (3 s.f.) or $x = -0.135$ (3 s.f.)

Solving a quadratic equation by the quadratic formula

- The quadratic formula might look complicated but it just uses the coefficients a, b and c from the quadratic equation
- The quadratic formula will work for any quadratic