

- 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.

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

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

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

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

$$\text{Or } x = 2.47 \text{ (3 s.f.) or } x = -0.135 \text{ (3 s.f.)}$$

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

QUADRATIC FORMULA

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

e.g. $x^2 - 3x - 6 = 0$

DISCRIMINANT
FIRST...

→ " $b^2 - 4ac$ ": $(-3)^2 - 4(1)(-6) = 33$

... MAKES THIS
LINE EASIER!

→ $x = \frac{3 \pm \sqrt{33}}{2}$

$x = \frac{3 + \sqrt{33}}{2}$ OR $x = \frac{3 - \sqrt{33}}{2}$

KEEP ANSWERS EXACT
UNLESS INSTRUCTED
OTHERWISE