

Section 2.1 Quadratic equations

2. Use the quadratic formula to solve each of the following, giving your answers correct to one place of decimals:

(a) (i) $x^2 - 2x - 2 = 0$

$$\begin{aligned} a &= 1 \\ b &= -2 \\ c &= -2 \end{aligned}$$

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


$$= \frac{2 \pm \sqrt{4+8}}{2} = \frac{2 \pm \sqrt{12}}{2} = \frac{2 \pm 2\sqrt{3}}{2} = 1 \pm \sqrt{3}$$

$$x_1 = 1 + \sqrt{3} = 2.7$$

$$x_2 = 1 - \sqrt{3} = -0.7$$

Remember...

$$\text{If } ax^2 + bx + c = 0$$

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


3. Use the quadratic formula to solve each of the following, leaving your answers in surd form:

(a) (i) $3x^2 + 4x - 5 = 0$

$$\begin{aligned} a &= 3 \\ b &= 4 \\ c &= -5 \end{aligned}$$

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

$$= \frac{-4 \pm 2\sqrt{19}}{6} = \frac{-2 \pm \sqrt{19}}{3}$$

$$x_1 = \frac{-2 + \sqrt{19}}{3}$$

$$x_2 = \frac{-2 - \sqrt{19}}{3}$$

Remember...

$$\text{If } ax^2 + bx + c = 0$$

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