Quadratic Formula Examples

Ex. 1 $x^2 - 2x - 24 = 0$ so $a = 1$, $b = -2$, $c = -24$

$$x = \frac{2 \pm \sqrt{(-2)^2 - 4 \cdot 1 \cdot -24}}{2 \cdot 1} = \frac{2 \pm \sqrt{4 + 96}}{2} = \frac{2 \pm \sqrt{100}}{2} =$$

$$= \frac{2 \pm 10}{2} = 1 \pm 5$$

So $x = 1 + 5 = 6$
or
$x = 1 - 5 = -4$

Ex. 2 $3x^2 - 21x + 6 = 0$ so $a = 3$, $b = -21$, $c = 6$

$$x = \frac{21 \pm \sqrt{(-21)^2 - 4 \cdot 3 \cdot 6}}{2 \cdot 3} = \frac{21 \pm \sqrt{441 - 72}}{6} = \frac{21 \pm \sqrt{369}}{6} =$$

$$= \frac{21 \pm 3\sqrt{41}}{6} = \frac{7 \pm \sqrt{41}}{2}$$

So $x = \frac{7 + \sqrt{41}}{2}$
or
$x = \frac{7 - \sqrt{41}}{2}$

Ex. 3 $x^2 - 10x + 29 = 0$ so $a = 1$, $b = -10$, $c = 29$

$$x = \frac{10 \pm \sqrt{(-10)^2 - 4 \cdot 1 \cdot 29}}{2 \cdot 1} = \frac{10 \pm \sqrt{100 - 116}}{2} = \frac{10 \pm \sqrt{-16}}{2} =$$

$$= \frac{10 \pm 4i}{2} = 5 \pm 2i$$

So $x = 5 + 2i$
or
$x = 5 - 2i$