

# EQ: How DO YOU SOLVE QUAD. EQUATIONS?

Background: Perfect square trinomials		Factor:	Fill in the blank:
$(x+5)^2 = (x+5)(x+5)$ $= x^2 + 5x + 5x + 25$ $= x^2 + 10x + 25$ $\quad \underline{5 \times 2} \quad \underline{5^2}$	$(x-3)^2 = (x-3)(x-3)$ $= x^2 - 3x - 3x + 9$ $= x^2 - 6x + 9$ $\quad \underline{-3 \times 2} \quad \underline{(-3)^2}$	$x^2 + 12x + 36$ $(x+6)^2$ $x^2 - 20x + 100$ $(x-10)^2$	$x^2 + 14x + \underline{49}$ $\quad \underline{7 \times 2} \quad \underline{7^2}$ $x^2 - 24x + \underline{144}$ $\quad \underline{-12 \times 2} \quad \underline{(-12)^2}$

What if we don't have a perfect square trinomial? We can make one!

Solve by completing the square

A) Rearrange to look like  $ax^2 + bx + \square = c + \square$

$$x^2 - 6x - 40 = x^2 - 6x - 40$$

$$x^2 - 6x + \square = 40 + \square$$

B) If  $a \neq 1$ , divide every term by 'a'.

$$\left(\frac{b}{2}\right)^2 = \left(\frac{-6}{2}\right)^2$$

C) In  $\square$  write  $\left(\frac{b}{2}\right)^2$

$$x^2 - 6x + \boxed{9} = 40 + \boxed{9}$$

$$\sqrt{(x-3)^2} = \sqrt{49}$$

D) Write left side as factors

E) Square root and solve

$$x - 3 = \pm 7$$

$$\frac{x \pm 0}{1} \quad \frac{4}{1}$$

$$1) 0 = x^2 - 8x + 11 \quad \left(\frac{-8}{2}\right)^2$$

$$\begin{matrix} -11 & -11 \end{matrix}$$

$$2) 0 = x^2 + 4x - 4$$

$$3) 0 = x^2 - 8x + 6$$

$$-11 + \boxed{16} = x^2 - 8x + \boxed{16}$$
$$\sqrt{5} = \sqrt{(x-4)^2}$$

$$\pm\sqrt{5} = x - 4$$

$$\begin{matrix} x-4 = \sqrt{5} & x-4 = -\sqrt{5} \\ +4 & +4 & +4 & +4 \end{matrix}$$

$$\boxed{4 + \sqrt{5} = x = 4 - \sqrt{5}}$$

$$\boxed{x = 4 \pm \sqrt{5}}$$

$$4) 0 = 2x^2 + 8x + 9$$

$$5) 0 = -x^2 - 2x - 6$$

$$6) 0 = 3x^2 + 6x$$

$$\frac{-9}{2} + \boxed{\phantom{0}} = \frac{2x^2}{2} + \frac{8x}{2} + \boxed{\phantom{0}}$$

$$\left(\frac{4}{2}\right)^2 = 4$$

$$-4.5 + \boxed{4} = x^2 + 4(x + \boxed{4})$$

$$\sqrt{-0.5} = \sqrt{(x+2)^2}$$

No solution (yet)

