

Solving Quadratics Worksheet

Factorising and Solving Quadratic Equations

I Do

- (a) Factorise $x^2 - 11x + 24$
(b) Hence, solve the equation $x^2 - 11x + 24 = 0$

We Do

- (a) Factorise $x^2 - 10x + 21$
(b) Hence, solve the equation $x^2 - 10x + 21 = 0$

You Do

- (a) Factorise $x^2 - 13x + 36$
(b) Hence, solve the equation $x^2 - 13x + 36 = 0$

Challenge

- (a) Fully factorise $2x^2 - 20x + 42$
(b) Hence, solve the equation $2x^2 - 20x + 42 = 0$

Answers & Worked Solutions

• I Do:

(a) We need two numbers that multiply to 24 and add to -11.

These are -3 and -8.

Factorised form: $(x - 3)(x - 8)$

(b) $(x - 3)(x - 8) = 0$

Either $x - 3 = 0 \implies x = 3$

Or $x - 8 = 0 \implies x = 8$

Answer: (a) $(x - 3)(x - 8)$ (b) $x = 3, x = 8$

• We Do:

(a) Multiply to 21, add to -10 $\implies -3$ and -7 .

Factorised form: $(x - 3)(x - 7)$

(b) $(x - 3)(x - 7) = 0$

$x = 3$ or $x = 7$

Answer: (a) $(x - 3)(x - 7)$ (b) $x = 3, x = 7$

• You Do:

(a) Multiply to 36, add to -13 $\implies -4$ and -9 .

Factorised form: $(x - 4)(x - 9)$

$$(b) (x - 4)(x - 9) = 0$$

$$x = 4 \text{ or } x = 9$$

$$\text{Answer: (a) } (x - 4)(x - 9) \quad (b) x = 4, x = 9$$

• **Challenge:**

(a) First, factor out the common factor of 2:

$$2(x^2 - 10x + 21)$$

Then factorise the quadratic inside the bracket (multiply to 21, add to -10):

$$2(x - 3)(x - 7)$$

$$(b) 2(x - 3)(x - 7) = 0$$

$$\text{Divide by 2} \implies (x - 3)(x - 7) = 0$$

$$x = 3 \text{ or } x = 7$$

$$\text{Answer: (a) } 2(x - 3)(x - 7) \quad (b) x = 3, x = 7$$