

Expanding, Factorising and Solving Quadratics

ANSWERS

Calculator | 30 minutes | Total marks: 30

Name Class

1

Expand and simplify

(a) $3(2x - 5) - 2(x - 4)$

$$6x - 15 - 2x + 8 \text{ (1)}$$

Answer $4x - 7$ (1) [2 marks]

(b) $(x + 4)(x - 7)$

$$x^2 - 7x + 4x - 28 \text{ (1)}$$

Answer $x^2 - 3x - 28$ (1) [2 marks]

(c) $(2x + 3)(3x - 1)$

$$6x^2 - 2x + 9x - 3 \text{ (1)}$$

Answer $6x^2 + 7x - 3$ (1) [2 marks]

2

Expand and simplify $(x + 1)(x + 2)(x + 3)$

$$(x^2 + 3x + 2)(x + 3) \text{ (1)}$$

$$x^3 + 3x^2 + 3x^2 + 9x + 2x + 6 \text{ (1)}$$

Answer $x^3 + 6x^2 + 11x + 6$ (1) [3 marks]

3

Factorise fully

(a) $12x^2y - 18xy^2$

Answer $6xy(2x - 3y)$ (1)(1) [2 marks]

(b) $x^2 + 9x + 20$

Answer $(x + 4)(x + 5)$ (1)(1) [2 marks]

(c) $x^2 - 49$

Answer $(x + 7)(x - 7)$ (1) [1 mark]

(d) $2x^2 + 7x + 3$

Answer $(2x + 1)(x + 3)$ (1)(1) [2 marks]

4

Solve $x^2 - 5x - 14 = 0$

$$(x - 7)(x + 2) = 0 \text{ (1)(1)}$$

 $x =$ $7 \text{ or } -2$ (1) [3 marks]

5

(a) Write $x^2 + 6x + 2$ in the form $(x + a)^2 + b$

$$(x + 3)^2 - 7 + 2 \text{ (1)}$$

Answer $(x + 3)^2 - 7$ (1) [2 marks](b) Write down the coordinates of the turning point of the graph of $y = x^2 + 6x + 2$ Answer $(-3, -7)$ (1) [1 mark]

6

Solve $2x^2 + 5x - 1 = 0$

Give your answers to 2 decimal places.

$$\begin{aligned} x &= \frac{-5 \pm \sqrt{5^2 - 4 \times 2 \times -1}}{2 \times 2} \text{ (1)} \\ &= \frac{-5 \pm \sqrt{33}}{4} \text{ (1)} \end{aligned}$$

 $x =$ $0.19 \text{ or } -2.69$ (1) [3 marks]

7

A rectangle has a length of $(x + 5)$ cm and a width of x cm.

The area of the rectangle is 36 cm^2

(a) Show that $x^2 + 5x - 36 = 0$

$$x(x + 5) = 36 \text{ (1)}$$

[1 mark]

(b) Work out the length of the rectangle.

$$(x + 9)(x - 4) = 0, \text{ so } x = 4 \text{ (1)}$$

Answer 9 (1) cm [2 marks]

8

$$(x + a)(x + 3) \equiv x^2 + 7x + b$$

Work out the values of a and b .

$$a + 3 = 7 \text{ (1)}$$

$$a = \underline{4}$$

$$b = \underline{12 \text{ (1)}} \quad [2 \text{ marks}]$$

Question	Topic	RAG
1	I can expand and simplify brackets	
2	I can expand three brackets	
3	I can factorise expressions and quadratics	
4	I can solve a quadratic equation by factorising	
5	I can complete the square and find a turning point	
6	I can use the quadratic formula	
7	I can form and solve a quadratic equation from a problem	
8	I can equate coefficients	