

Expressions, Equations and Formulae

ANSWERS

No calculator | 30 minutes | Total marks: 30

Name Class

1 Expand and simplify

(a) $(x+5)(x+2)$

$$x^2 + 2x + 5x + 10 \text{ (1)}$$

Answer $x^2 + 7x + 10$ (1) [2 marks]

(b) $(x-3)(x+7)$

$$x^2 + 7x - 3x - 21 \text{ (1)}$$

Answer $x^2 + 4x - 21$ (1) [2 marks]

2 Factorise

(a) $x^2 + 8x + 15$

$$3 \times 5 = 15 \text{ and } 3 + 5 = 8 \text{ (1)}$$

Answer $(x+3)(x+5)$ (1) [2 marks]

(b) $x^2 - 2x - 8$

$$-4 \times 2 = -8 \text{ and } -4 + 2 = -2 \text{ (1)}$$

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

(c) $x^2 - 25$

Answer $(x+5)(x-5)$ (1) [1 mark]

3

Solve

(a) $\frac{x}{4} + 3 = 8$

$$\frac{x}{4} = 5 \text{ (1)}$$

$$x = 20 \text{ (1)}$$

[2 marks]

(b) $4(x - 2) = 20$

$$4x - 8 = 20 \text{ or } x - 2 = 5 \text{ (1)}$$

$$x = 7 \text{ (1)}$$

[2 marks]

(c) $5x + 2 = 3x + 12$

$$2x + 2 = 12 \text{ (1)}$$

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

[2 marks]

(d) $2(3x + 1) = 4x + 15$

$$6x + 2 = 4x + 15 \text{ (1)}$$

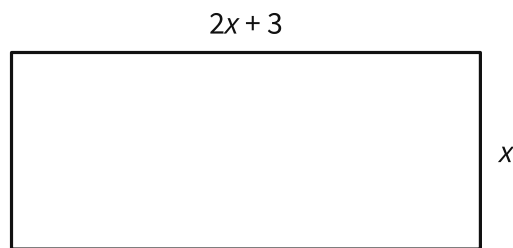
$$2x = 13 \text{ (1)}$$

$$x = 6.5 \text{ (1)}$$

[3 marks]

4

Here is a rectangle.



Not drawn accurately

The perimeter of the rectangle is 36 cm.

(a) Show that $6x + 6 = 36$

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

$$= 6x + 6, \text{ and the perimeter is } 36 \text{ (1)}$$

[2 marks]

(b) Work out the length of the rectangle.

$$6x = 30, \text{ so } x = 5 \text{ (1)}$$

$$2 \times 5 + 3$$

Answer 13 (1) cm [2 marks]

5

A plumber charges a call out fee of £40 plus £25 for each hour.

Write a formula for the total charge, C pounds, for a job that takes h hours.

$$25h \text{ seen (1)}$$

Answer $C = 40 + 25h$ (1) [2 marks]

6

(a) Make x the subject of $y = 3x - 2$

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

$$x = \frac{y + 2}{3} \text{ (1)}$$

[2 marks]

(b) Make x the subject of $y = \frac{x}{5} + 4$

$$y - 4 = \frac{x}{5} \text{ (1)}$$

$$x = 5(y - 4) \text{ (1)}$$

[2 marks]

7 Write as a single fraction $\frac{x}{2} + \frac{x}{3}$

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

Answer $\frac{5x}{6} \text{ (1)}$

[2 marks]

Question	Topic	RAG
1	I can expand and simplify double brackets	
2	I can factorise quadratics, including the difference of two squares	
3	I can solve equations with fractions, brackets and unknowns on both sides	
4	I can form and solve an equation from a problem	
5	I can write a formula	
6	I can change the subject of a formula	
7	I can add algebraic fractions	