



- 1 Expand and simplify $(x + 4)(x + 6)$

(2 marks)

$$(x + 4)(x + 6) = x^2 + 6x + 4x + 24$$

Collect like terms: $x^2 + 10x + 24$

$$\boxed{x^2 + 10x + 24}$$

- 2 Expand and simplify $(x - 3)(x + 8)$

(2 marks)

$$(x - 3)(x + 8) = x^2 + 8x - 3x - 24$$

Collect like terms: $x^2 + 5x - 24$

$$\boxed{x^2 + 5x - 24}$$

- 3 Expand and simplify $(x - 4)(x - 6)$

(2 marks)

$$= (x - 4)(x - 6)$$

$$= x^2 - 6x - 4x + 24$$

$$\boxed{x^2 - 10x + 24}$$

- 4 Expand and simplify $(x + 7)^2$

(2 marks)

Write it out twice

$$= (x + 7)(x + 7)$$

$$= x^2 + 7x + 7x + 49$$

$$\boxed{x^2 + 14x + 49}$$

- 5 Expand and simplify $(x - 5)^2$

(2 marks)

Write it out twice

$$= (x - 5)(x - 5)$$

$$= x^2 - 5x - 5x + 25$$

$$\boxed{x^2 - 10x + 25}$$

6 Expand and simplify $(2x + 3)(x + 4)$

(3 marks)

$$\begin{aligned} &= (2x + 3)(x + 4) \\ &= 2x^2 + 8x + 3x + 12 \end{aligned}$$

$$\boxed{2x^2 + 11x + 12}$$

7 A square has sides of length $(x + 3)$ cm.
Show that the area of the square is $(x^2 + 6x + 9)$ cm².

(3 marks)

$$\begin{aligned} \text{area} &= (x + 3)(x + 3) \\ &= x^2 + 3x + 3x + 9 \\ &= x^2 + 6x + 9 \end{aligned}$$

$$\boxed{x^2 + 6x + 9}$$

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

(3 marks)

$$\begin{aligned} &= (2x + 3)(3x - 1) \\ &= 6x^2 - 2x + 9x - 3 \end{aligned}$$

$$\boxed{6x^2 + 7x - 3}$$

9 Expand and simplify $(3x - 2)(2x - 5)$

(3 marks)

$$\begin{aligned} &= (3x - 2)(2x - 5) \\ &= 6x^2 - 15x - 4x + 10 \end{aligned}$$

$$\boxed{6x^2 - 19x + 10}$$

10 Expand and simplify $(2x - 1)^2$

(3 marks)

$$\begin{aligned} &= (2x - 1)(2x - 1) \\ &= 4x^2 - 2x - 2x + 1 \end{aligned}$$

$$\boxed{4x^2 - 4x + 1}$$

11 Expand and simplify $(x + 3)(x + 4) + (x + 1)(x + 2)$

(4 marks)

First bracket pair

$$(x + 3)(x + 4) = x^2 + 7x + 12$$

Second bracket pair

$$(x + 1)(x + 2) = x^2 + 3x + 2$$

Add

$$2x^2 + 10x + 14$$

12 Expand and simplify $(x + 6)(x - 2) - (x + 1)(x - 3)$

(4 marks)

$$(x + 6)(x - 2) = x^2 + 4x - 12$$

$$(x + 1)(x - 3) = x^2 - 2x - 3$$

Subtract the whole bracket, change every sign

$$= x^2 + 4x - 12 - x^2 + 2x + 3$$

$$6x - 9$$

- 13 A rectangular card measures $(x + 5)$ cm by $(x + 3)$ cm.
A square of side x cm is cut from the card.
Show that the area of card remaining is $(8x + 15)$ cm².

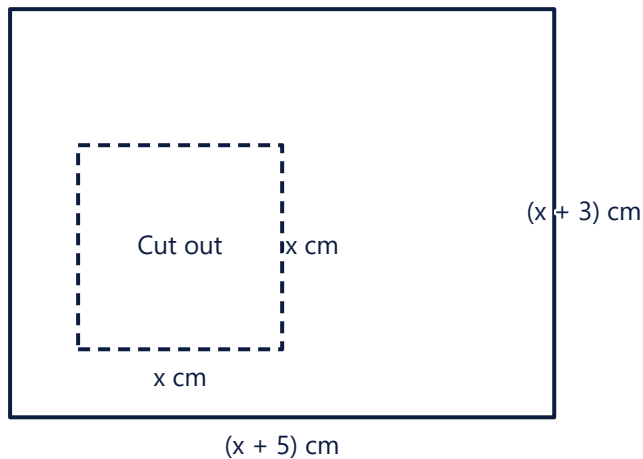


Diagram NOT accurately drawn

(3 marks)

$$\text{Area of rectangle} = (x + 5)(x + 3) = x^2 + 3x + 5x + 15 = x^2 + 8x + 15$$

$$\text{Area of square removed} = x^2$$

$$\text{Remaining area} = x^2 + 8x + 15 - x^2 = 8x + 15$$

- 14 a. Expand and simplify $(x + 9)(x - 2)$
b. Factorise $x^2 - 3x - 28$

(4 marks)

$$\text{a) } (x + 9)(x - 2) = x^2 - 2x + 9x - 18 = x^2 + 7x - 18$$

b) Find two numbers that multiply to -28 and add to -3 : they are -7 and 4

$$\text{b) } x^2 - 3x - 28 = (x - 7)(x + 4)$$

- 15 a. Expand and simplify $(2x + 3)(x - 4)$
b. Factorise fully $6y^2 + 9y$

(4 marks)

$$\text{a) } (2x + 3)(x - 4) = 2x^2 - 8x + 3x - 12 = 2x^2 - 5x - 12$$

b) The highest common factor of $6y^2$ and $9y$ is $3y$

$$\text{b) } 6y^2 + 9y = 3y(2y + 3)$$

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a. Expand and simplify $(y + 7)(y - 7)$ b. Factorise $x^2 + x - 30$

(4 marks)

$$a) (y + 7)(y - 7) = y^2 - 7y + 7y - 49 = y^2 - 49$$

b) Find two numbers that multiply to -30 and add to 1: they are 6 and -5

$$b) x^2 + x - 30 = (x + 6)(x - 5)$$