

Expanding and Factorising Single Brackets

GCSE Mathematics • Foundation Tier • Grades 2–3 • Non-calculator

WORKED SOLUTIONS

Name: _____ *worked example* _____

Class:

Total: ____ *47* ____ / 47

Show all your working. Marks are given for correct method as well as the final answer.

1. Expand $4(x + 3)$. [2 marks]

$$\begin{aligned} 4 \times x &= 4x \\ 4 \times 3 &= 12 \\ \text{multiply BOTH terms} \end{aligned}$$

Answer: _____ *4x + 12* _____

2. Expand $5(y - 2)$. [2 marks]

$$\begin{aligned} 5 \times y &= 5y \\ 5 \times -2 &= -10 \end{aligned}$$

Answer: _____ *5y - 10* _____

3. Expand $x(x + 6)$. [2 marks]

$$\begin{aligned} x \times x &= x^2 \\ x \times 6 &= 6x \end{aligned}$$

Answer: _____ *x^2 + 6x* _____

4. Expand $3x(x - 4)$. [2 marks]

$$\begin{aligned} 3x \times x &= 3x^2 \\ 3x \times -4 &= -12x \end{aligned}$$

Answer: _____ *3x^2 - 12x* _____

5. Expand $-2(x + 5)$. [2 marks]

$$\begin{aligned} -2 \times x &= -2x \\ -2 \times 5 &= -10 \\ \text{both terms go negative} \end{aligned}$$

Answer: _____ *-2x - 10* _____

6. Expand $-3(2x - 7)$. [2 marks]

$$\begin{aligned} -3 \times 2x &= -6x \\ -3 \times -7 &= +21 \\ \text{minus} \times \text{minus} &= \text{plus!} \end{aligned}$$

Answer: _____ *-6x + 21* _____

7. Expand $2x(3x + 5)$. [2 marks]

$$\begin{aligned} 2x \times 3x &= 6x^2 \\ 2x \times 5 &= 10x \end{aligned}$$

Answer: _____ *6x^2 + 10x* _____

8. Expand and simplify $3(x + 2) + 4(x + 5)$. [3 marks]

$$\begin{aligned} 3(x + 2) &= 3x + 6 \\ 4(x + 5) &= 4x + 20 \end{aligned}$$

$$3x + 4x = 7x$$

$$6 + 20 = 26$$

Answer: _____ $7x + 26$ _____

9. Expand and simplify $5(2x + 1) - 2(x + 4)$. [3 marks]

$$5(2x + 1) = 10x + 5$$

$$-2(x + 4) = -2x - 8$$

the minus hits BOTH terms

$$10x - 2x = 8x$$

$$5 - 8 = -3$$

Answer: _____ $8x - 3$ _____

10. Expand and simplify $x(x + 3) + 2(x + 3)$. [3 marks]

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

$$2(x + 3) = 2x + 6$$

$$3x + 2x = 5x$$

Answer: _____ $x^2 + 5x + 6$ _____

11. Factorise $3x + 12$. [2 marks]

3 goes into both

$$3x \div 3 = x, 12 \div 3 = 4$$

Answer: _____ $3(x + 4)$ _____

12. Factorise $10y - 15$. [2 marks]

highest common factor is 5
not 1 -- take out the BIGGEST

Answer: _____ $5(2y - 3)$ _____

13. Factorise $x^2 + 9x$. [2 marks]

both terms have an x
take x outside

Answer: _____ $x(x + 9)$ _____

14. Factorise $8x^2 - 6x$. [2 marks]

common number: 2
common letter: x
so take out 2x

Answer: _____ $2x(4x - 3)$ _____

15. Factorise fully $12x^2 + 18x$. [2 marks]

HCF of 12 and 18 is 6
both have an x
fully = take out 6x, not 2x or 3x

Answer: _____ $6x(2x + 3)$ _____

16. Factorise $4x + 4y + 4z$. [2 marks]

4 is in all three terms

Answer: _____ $4(x + y + z)$ _____

17. Factorise $7ab - 14a$.

[2 marks]

common number: 7
common letter: a
take out 7a

Answer: 7a(b - 2)

18. Jamil says $3(x + 4) = 3x + 4$. Explain his mistake and write the correct expansion.

[2 marks]

he only multiplied the first term
the 3 must hit the 4 as well
 $3 \times 4 = 12$

Answer: $3x + 12$

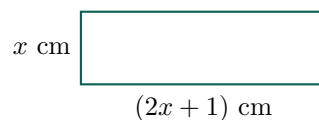
19. Expand and simplify $2x(x + 3) - x(x - 1)$.

[3 marks]

$2x(x + 3) = 2x^2 + 6x$
 $-x(x - 1) = -x^2 + x$
 $2x^2 - x^2 = x^2$
 $6x + x = 7x$

Answer: $x^2 + 7x$

20. Here is a rectangle.



(a) Write an expression for the perimeter, expanded and simplified.

[3 marks]

perimeter = $2(\text{length}) + 2(\text{width})$
 $= 2(2x + 1) + 2(x)$
 $= 4x + 2 + 2x$
 $= 6x + 2$

(b) The perimeter is 38 cm. Find x .

[2 marks]

$6x + 2 = 38$
 $6x = 36$
 $x = 6$

Answer: $x = 6$ cm