

WA8MNA3

Algebraic techniques

Core + Challenge

Expanding Brackets

I can use the distributive law to expand brackets, including negative multipliers, and then collect like terms.

Name: _____ Date: _____ Score: _____ / 58

Key idea

Distributive law: multiply **every** term inside the brackets by the term outside. $4(x + 3) = 4x + 12$

Pronumeral outside: $x(x - 5) = x^2 - 5x$; $2a(3a + b) = 6a^2 + 2ab$

Negative outside: every sign inside changes. $-3(y - 4) = -3y + 12$; $-(2m + 1) = -2m - 1$

Expand, then collect like terms: $3(2x - 5) - 2(x - 4) = 6x - 15 - 2x + 8 = 4x - 7$

A

Fluency *practise the skill*

/ 16 marks

Expand (and simplify where possible). 1 mark each.

1. $3(x + 4)$ _____

9. $-4(n - 3)$ _____

2. $5(a - 2)$ _____

10. $-(x - 7)$ _____

3. $2(3m + 7)$ _____

11. $3a(2a - b)$ _____

4. $4(2y - 5)$ _____

12. $-5y(2y - 1)$ _____

5. $x(x + 6)$ _____

13. $2(x + 3) + 5$ _____

6. $a(3 - a)$ _____

14. $4(a - 1) + 3a$ _____

7. $2p(p + 4)$ _____

15. $3(2x + 1) + 2(x + 4)$ _____

8. $-2(k + 5)$ _____

16. $5(m + 2) - 3(m - 1)$ _____

B

Core *apply the skill to problems*

/ 22 marks

- 1 Write the total area of this rectangle in two ways: as a product with brackets, and in expanded form.

[2 marks]



Answer: _____

- 2 Use this area model to expand $3a(2a + 5)$.

[2 marks]



Answer: _____

- 3 Use the distributive law to calculate 7×98 mentally. Show your method.

[2 marks]

Answer: _____

- 4 Expand and simplify $4(3a + 2) - 3(a - 5)$

[2 marks]

Answer: _____

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

[2 marks]

Answer: _____

Expanding Brackets · WA8MNAA3

- 6 At Coles, a pack of muesli bars costs $\$(m + 2)$. Nina buys 5 packs and a \$4 drink. Write an expanded, simplified expression for her total cost. [2 marks]

.....

Answer: _____

- 7 A rectangle is $(2x + 3)$ cm long and 5 cm wide. Write expanded expressions for its perimeter and its area. [3 marks]

.....

.....

Answer: _____

- 8 Expand and simplify $-2y(3y - 4) + 5(y^2 - 2y)$ [2 marks]

.....

Answer: _____

- 9 Show that $6(a + 2) - 2(3a - 1)$ always equals 14, whatever the value of a . [2 marks]

.....

Answer: _____

- 10 A Dockers member pays $\$(3p - 4)$ per match for 8 home games, and $\$(2p + 5)$ per match for 3 finals. Write an expanded, simplified expression for the total cost. [3 marks]

.....

.....

Answer: _____

Expanding Brackets · WA8MNAA3

C**Reasoning** *explain, justify and check*

/ 9 marks

- 1 Ben expanded $-3(x - 4)$ and got $-3x - 12$. Explain his mistake and give the correct answer. [2 marks]

.....

.....

- 2 Use an area model (a rectangle) to explain why $5(x + 2) \neq 5x + 2$. [2 marks]

.....

.....

.....

- 3 True or false: $2(a + b) - (a - b) = a + 3b$. Show your working. [2 marks]

.....

.....

- 4 Explain how $4 \times 23 = 4 \times 20 + 4 \times 3$ shows the distributive law. Use the same method to find 6×47 . [3 marks]

.....

.....

.....

D**Challenge** *multi-step and problem-solving*

/ 11 marks

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

.....

.....

Answer: _____

- 2 Find the numbers a and b if $4(3x + a) - b(x - 2) = 7x + 18$ for every value of x . [3 marks]

.....

.....

Answer: _____

Expanding Brackets · WA8MNAA3

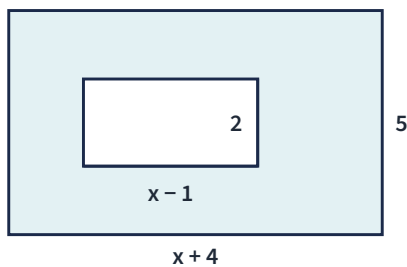
- 3 Think of a number n . Add 3, multiply by 4, subtract $2n$, subtract 12, then halve the result. Use algebra to show you always get back to n . [2 marks]

.....

.....

Answer:

- 4 A rectangular garden bed $(x + 4)$ m by 5 m has a rectangular pond $(x - 1)$ m by 2 m in it. Find an expanded expression for the area of garden (shaded), then its area when $x = 6$. [3 marks]



.....

.....

Answer:

How did I go?

Fluency ___ / 16 Core ___ / 22 Reasoning ___ / 9 Challenge ___ / 11 **Total** ___ / 58

Stuck on a section? Our Year 8 tutors can show you exactly what to practise next. **Book a free trial class at edulift.com.au**