

WA8MNAA2

Algebraic techniques

Core + Challenge

Multiplying and Dividing Algebraic Terms

I can multiply and divide algebraic terms with coefficients and signs, and use the order of operations to simplify.

Name: _____ Date: _____ Score: _____ / 58

Key idea

Multiplying terms: multiply the numbers, then the pronumerals. $3a \times 4b = 12ab$; $2x \times 5x = 10x^2$

Signs: same signs give a positive; different signs give a negative. $-4m \times 3n = -12mn$; $-2p \times (-5q) = 10pq$

Dividing terms: write as a fraction and cancel common factors. $12ab \div 4b = \frac{12ab}{4b} = 3a$

Order of operations: $\times$ and $\div$ before $+$ and $-$. $2a \times 3 + 4a = 6a + 4a = 10a$

A Fluency *practise the skill*

/ 16 marks

Simplify each expression. 1 mark each.

1. $4 \times 3a$ _____

9. $12ab \div 4b$ _____

2. $5x \times 2y$ _____

10. $-18mn \div 6m$ _____

3. $3m \times 4m$ _____

11. $24x^2 \div 8x$ _____

4. $-6a \times 2b$ _____

12. $\frac{15pq}{5q}$ _____

5. $-3p \times (-7q)$ _____

13. $-7a \times (-a)$ _____

6. $2a \times 3b \times 4c$ _____

14. $3a \times 4 + 2a$ _____

7. $5xy \times 2x$ _____

15. $18y \div 3 - 2y$ _____

8. $20k \div 4$ _____

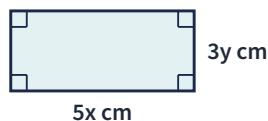
16. $36a^2b \div (-9ab)$ _____

B

Core *apply the skill to problems*

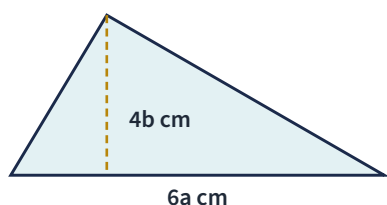
/ 22 marks

- 1 Find an expression for the area of this rectangle. [2 marks]



Answer: _____

- 2 Find an expression for the area of this triangle. [2 marks]



Answer: _____

- 3 A rectangle has an area of $24mn \text{ cm}^2$ and a width of $4n \text{ cm}$. Find its length. [2 marks]

Answer: _____

- 4 A family buys $3a$ adult tickets to an AFL match at Optus Stadium. Each ticket costs $\$2b$. Write a simplified expression for the total cost. [2 marks]

Answer: _____

- 5 Simplify $4a \times 3b \div 6a$ [2 marks]

Answer: _____

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- 6 Simplify $2x \times 5y - 3xy$ [2 marks]

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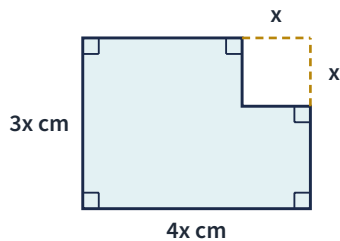
Answer: _____

- 7 Simplify $-3m \times 4n + 20mn \div 5$ [2 marks]

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Answer: _____

- 8 A square of side x cm is cut from the corner of a $4x$ cm by $3x$ cm rectangle. Find a simplified expression for the area that is left (shaded). [3 marks]



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Answer: _____

- 9 A box is $2a$ cm long, $3a$ cm wide and $5b$ cm high. Find an expression for its volume. [2 marks]

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Answer: _____

- 10 A Rottnest ferry charter costs $\$36pq$, shared equally by $9p$ students. Each student also pays $\$2q$ for lunch. Write a simplified expression for each student's total cost. [3 marks]

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Answer: _____

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C

Reasoning *explain, justify and check*

/ 9 marks

- 1 Noah wrote $3a \times 4a = 12a$. Explain his mistake and give the correct answer. [2 marks]

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- 2 Explain why $-2x \times (-3y)$ is positive, and simplify it. [2 marks]

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- 3 True or false: $12x \div 4x = 3x$. Give a reason. [2 marks]

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- 4 Jo simplified $6 + 2a \times 4$ by working left to right and got $32a$. Explain the correct simplification, and check both answers with $a = 1$. [3 marks]

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D

Challenge *multi-step and problem-solving*

/ 11 marks

- 1 A rectangle has an area of $18x^2y \text{ cm}^2$ and a length of $6xy \text{ cm}$. Find its width, then write a simplified expression for its perimeter. [3 marks]

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Answer: _____

- 2 Simplify $-2a \times 3ab \times (-4b) \div 12ab$ [2 marks]

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Answer: _____

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- 3 Find the missing term in each: (a) $\square \times (-3mn) = 12m^2n$ (b) $30x^2y \div \square = -5x$ [3 marks]

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Answer: _____

- 4 A solid cube has edges of $2a$ cm. A square hole of side a cm is cut straight through it, from the front face to the back face. Find a simplified expression for the volume that remains. [3 marks]

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Answer: _____

How did I go?

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

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