

WA7MNAA4

Algebraic techniques

Core + Challenge

Writing Algebraic Expressions

I can use a letter (variable) to represent an unknown number and write algebraic expressions for real situations.

Name: _____ Date: _____ Score: _____ / 58

Key idea

A **variable** is a letter that stands for a number. If a large bag has g chocolates, 3 large bags have $3 \times g = 3g$.

Conventions: write the number first ($3g$, not $g3$), leave out $\times$ ($a \times b = ab$), write $\div$ as a fraction ($a \div 4 = \frac{a}{4}$).

Order matters for $-$ and $\div$: '7 less than y ' is $y - 7$, **not** $7 - y$.

Example: 5 large bags and 2 small bags (m each) shared between 4 people $\rightarrow \frac{(5g+2m)}{4}$ chocolates each.

A

Fluency *practise the skill*

/ 16 marks

Write an algebraic expression for each.

1. 5 more than x _____

9. half of t _____

2. 7 less than y _____

10. the square of d _____

3. double n _____

11. the cost of b books at \$12 each _____

4. n multiplied by 6, then add 1 _____

12. w squared, plus 3 _____

5. a divided by 3 _____

13. total legs on c cows and h hens _____

6. the sum of p and q _____

14. the average of x and y _____

7. the product of 4 and k _____

15. perimeter of a square with side s _____

8. 10 less than 3 times m _____

16. 5 less than the product of a and b _____

B**Core** *apply the skill to problems*

/ 23 marks

- 1 A small bag holds m chocolates and a large bag holds g chocolates. Write an expression for: [3 marks]
- (a) 3 large bags and 1 small bag
 - (b) how many more are in a large bag than a small bag
 - (c) 5 large bags and 2 small bags shared equally between 4 people

.....

.....

- 2 A taxi charges \$4 to start plus \$2 per kilometre. Write an expression for the cost of a k km trip. [2 marks]

.....

Answer:

- 3 Ella is e years old. Her brother is 3 years older and her mum is 3 times Ella's age. [3 marks]
- (a) Write expressions for the brother's and mum's ages.
 - (b) Write and simplify an expression for the sum of all three ages.

.....

.....

Answer:

- 4 A rectangle has length l and width w . Write expressions for its perimeter and its area. [2 marks]

.....

Answer:

- 5 A phone plan costs \$25 per month plus 10 cents per text. Write an expression for the monthly cost (in dollars) when t texts are sent. [2 marks]

.....

Answer:

- 6 Write a real-life situation that could be described by the expression $5x + 3$. [2 marks]

.....

.....

Answer:

Writing Algebraic Expressions · WA7MNAA4

- 7 n friends share a \$60 pizza bill equally, and each also pays \$2 for a drink. Write an expression for what each person pays. [2 marks]

.....

Answer: _____

- 8 Airline carry-on bags must have length + width + depth of at most 115 cm. Write an expression for how many cm a bag with dimensions l, w and d is **under** the limit. [2 marks]

.....

.....

Answer: _____

- 9 Adult tickets cost \$a and child tickets cost \$c. Write an expression for the cost for 2 adults and 3 children. [2 marks]

.....

Answer: _____

- 10 n is a whole number. [3 marks]
(a) Write the next two consecutive whole numbers.
(b) Write and simplify an expression for the sum of all three numbers.

.....

.....

Answer: _____

C Reasoning *explain, justify and check*

/ 9 marks

- 1 Explain why $3a$ means $3 \times a$, and not the number $3a$ as in $30 + a$. [2 marks]

.....

.....

- 2 Are $n + 5$ and $5 + n$ always equal? Are $n - 5$ and $5 - n$ always equal? Explain with an example. [3 marks]

.....

.....

Writing Algebraic Expressions · WA7MNAA4

- 3 Jo writes '4 less than x ' as $4 - x$. Explain her mistake. [2 marks]

.....

.....

- 4 Explain the difference between a^2 and $2a$. Test your explanation with $a = 5$. [2 marks]

.....

.....

D Challenge *multi-step and problem-solving*

/ 10 marks

- 1 Think of a number, double it, add 6, halve the result, then subtract the number you first thought of. Use algebra to show you always end with 3. [3 marks]

.....

.....

.....

Answer: _____

- 2 Write an expression for the number of days in w weeks and d days. Then write an expression for the number of hours. [2 marks]

.....

.....

Answer: _____

- 3 An equilateral triangle with side x is joined to a square with side x along one full side. Write a simplified expression for the perimeter of the new shape. [2 marks]

.....

.....

Answer: _____

- 4 Two consecutive even numbers can be written as $2n$ and $2n + 2$. Write their sum, and explain why the sum can never be a multiple of 4. [3 marks]

.....

.....

Answer: _____

How did I go?

Fluency ____ / 16 Core ____ / 23 Reasoning ____ / 9 Challenge ____ / 10 **Total ____ / 58**

Stuck on a section? Our Year 7 tutors can show you exactly what to practise next. **Book a free trial class at edulift.com.au**