Worksheet | Algebra

Variables, formulas and substitution

Name: _____ Date: _____

8 questions | 27 marks | Show your working.

Use exact values where possible. Simplify fractions and state units when required.

1. A museum charges 6 dollars per ticket plus one booking fee of 4 dollars. The formula is $C = 6n + 4$, where C is the total cost in dollars. State what n represents, give the coefficient of n, and explain what the constant term represents. [3 marks]

2. Rewrite $5a$, ab and $3(b + 2)$ using multiplication signs. Then evaluate ab when $a = 2$ and $b = 4$. [4 marks]

3. When $u = 3$ and $v = 5$, evaluate [4 marks]

(a) $3u + v$

(b) $u + u + v$. Show each substitution. Are the results equal?

4. Evaluate $4(p + 2)$ when $p = 3$. Leo instead calculates $4 \times 3 + 2 = 14$. Explain why his method does not match the expression. [3 marks]

5. Evaluate $s^2 + 2s$ when $s = 5$. Show the values of s^2 and $2s$ separately before adding them. [3 marks]

6. Three seedlings have heights a, b and c, all in centimetres. Their mean height is given by $m = \frac{a+b+c}{3}$. Find m when $a = 12$, $b = 15$ and $c = 18$. Explain why you add before dividing. [3 marks]

7. A rectangular label has length $l = 9$ cm and width $w = 4$ cm. Use $P = 2l + 2w$ to find its perimeter. State the unit and check your answer by adding its four side lengths. [3 marks]

8. A bike hire business uses $C = 7h + 4$, where C is the total cost in dollars and h is the number of hours. Find the cost for [4 marks]

(a) 2 hours

(b) 4 hours. Mia says doubling 2 hours to 4 hours doubles the total cost. Use your results and the formula to explain whether she is correct.