Topic test | Algebra

Algebra - practice test 3

Name: _____ Date: _____

16 questions | 46 marks | 60 minutes

Interpret costs, lengths, shared quantities and algebraic claims in practical situations.

No calculator needed.

1. A shop sells x boxes and then $3x$ more. Express the total. [1 mark]

2. A student buys 5 pens costing p dollars each and a notebook costing 7 dollars. Write the total cost. [2 marks]

3. Two classes collect $7n + 4$ and $3n - 1$ bottles. Simplify the combined total. [2 marks]

4. A rectangular strip is 3 cm wide and $(2x + 5)$ cm long. Expand its area expression. [3 marks]

5. A group shares $8x + 12$ tokens equally among four people. Factorise the total to show the shares and give one share. [3 marks]

6. A phone plan costs $C = 12 + 5g$ dollars for g GB. Find the cost for 7 GB. [2 marks]

7. Route lengths are $4(x + 2)$ km and $(4x + 5)$ km. Which is longer, and by how much? [3 marks]

8. A student claims three bags each containing $(x-2)$ objects contain $3x-2$ objects altogether. Correct the expression. [3 marks]

9. A rectangle has perimeter P, length l and width w, with $P=2l+2w$. [4 marks]

(a) Make w the subject. [2 marks]

(b) Find w when $P=34$ m and $l=11$ m. [2 marks]

10. A score is $S=4a-2b$. Find it for $a=6$ and $b=-3$. [3 marks]

11. A rectangle side has length $(5x + 10)$ cm. [3 marks]

(a) Factorise the length expression. [1 mark]

(b) Interpret the factor 5 as a statement about lengths. [2 marks]

12. A machine uses $R = an + b$. Make n the subject and state the restriction on a. [3 marks]

13. Ticket totals are modelled by $A = 6(n + 2) - 2n$ and $B = 4n + 12$. Do these always agree? Explain. [3 marks]

14. Jay tests expressions only at $x = 0$. Explain why this cannot prove equivalence, using $2x$ and $3x$. [3 marks]

15. A teacher writes $6x^2 + 9x = 3x(2x + 3)$. [4 marks]

(a) Verify the equality by expanding the right-hand side. [2 marks]

(b) Explain why $3x$ is the greatest common factor of the original terms. [2 marks]

16. A delivery costs $C = 8 + 2d$ dollars for d kilometres. The budget is 30 dollars. [4 marks]

(a) Make d the subject. [2 marks]

(b) Find the maximum whole-kilometre distance within the budget. Explain briefly. [2 marks]