Marking guide | Algebra

Algebra - practice test 1

16 questions | 37 marks | 55 minutes

Simplify, expand, factorise and use formulas, with reasoning and checks.

Equivalent correct methods earn the corresponding marks.

1. Simplify $6x + 3x$. [1 mark]

$(6 + 3)x = 9x$.

Answer: $9x$

2. Simplify $8a - 5 + 2a + 9$. [2 marks]

$8a + 2a = 10a$ and $-5 + 9 = 4$.

Answer: $10a + 4$

3. Simplify $4p - 7q - 9p + 2q$. [2 marks]

$4p - 9p = -5p$; $-7q + 2q = -5q$.

Answer: $-5p - 5q$

4. Simplify $3x^2 \times 4x$. [2 marks]

$3 \times 4 = 12$; $x^2 x = x^3$.

Answer: $12x^3$

5. Expand $4(y + 6)$. [2 marks]

Multiply every term by 4.

Answer: $4y + 24$

6. Expand $-3(2x-5)$. [2 marks]

$(-3)(2x)+(-3)(-5)=-6x+15$.

Answer: $-6x+15$

7. Simplify $2(3a+4)+5a$. [2 marks]

$6a+8+5a=11a+8$.

Answer: $11a+8$

8. Fully factorise $12x+18$. [2 marks]

The greatest common factor is 6.

Answer: $6(2x+3)$

9. Fully factorise $10p^2-15p$. [2 marks]

The shared factor is $5p$.

Answer: $5p(2p-3)$

10. Evaluate $3x^2-2y$ for $x=-2$ and $y=5$. [2 marks]

$3(-2)^2-2(5)=12-10=2$.

Answer: 2

11. Make a the subject of $F=ma$, where $m\neq 0$. [2 marks]

Divide both sides by the non-zero mass.

Answer: $a=\frac{F}{m}$

12. Make x the subject of $y = 4x + 7$. [3 marks]

Subtract 7 and divide by 4.

Answer: $x = \frac{y - 7}{4}$

13. A rectangle has length $(x + 5)$ cm and width 4 cm. Simplify its perimeter. [3 marks]

$P = 2(x + 5) + 2(4) = 2x + 10 + 8 = 2x + 18$ cm.

Answer: $2x + 18$ cm

14. Show $3(2t + 1) - t$ and $5t + 3$ are equivalent. [3 marks]

$3(2t + 1) - t = 6t + 3 - t = 5t + 3$.

Answer: Both simplify to $5t + 3$.

15. A student writes $-2(x - 4) = -2x - 8$. Correct the error. [3 marks]

$(-2)(-4) = 8$, not -8.

Answer: $-2x + 8$

16. A taxi fare is $C = 5 + 3d$ dollars for d kilometres. [4 marks]

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

Subtract 5 from both sides, then divide by 3.

Answer: $d = \frac{C - 5}{3}$

(b) Find the distance when the fare is 32 dollars. [2 marks]

$d = (32 - 5) \div 3 = 9$ km.

Answer: 9 km