

Simplifying, expanding and factorising

Year 9 | Key Stage 3 | 14 questions, 51 marks

KS3 Maths topic practice



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Name: _____ **Date:** _____ **Score:** _____ / 51

1 a. Write each of these in the correct algebraic way.

(i) $a \times 4 \times b$ (ii) $m \div 3$ (iii) $y \times y \times 5$

b. Simplify $5p + 3q - 2p + q$

(3 marks)

Answer _____

2 Here are four lines of algebra.

A $3x + 2$ B $v = u + at$ C $4x - 1 = 11$ D $2(x + 3) \equiv 2x + 6$

a. Which one is an expression?

b. Which one is a formula?

c. Which one is an identity?

d. Write $\equiv$ in the box if the two sides are identical, or $\neq$ if they are not.

(i) $5(n - 2)$ $5n - 10$ (ii) $n^2 + n^2$ n^4 (iii) $3y + 2y$ $5y$

(4 marks)

Answer _____

3 a. Simplify $t^3 \times t^4$

b. Simplify $12h^5 \div 3h^2$

c. Simplify $5u + 3v - 2u + 7v$

(4 marks)

Answer _____

4

- a. Work out the value of $2a - 3b$ when $a = -1$ and $b = 4$.
 b. Work out the value of $4a^2 + b$ when $a = -3$ and $b = -7$.

(4 marks)

Answer _____

5

- a. The perimeter of a rectangle is given by the formula $P = 2(l + w)$
 Work out P when $l = 7.5$ and $w = 4$
 b. Work out the value of $3(x - 2)^2$ when $x = 5$
 c. Work out the value of $a^2 + 2ab$ when $a = -3$ and $b = 4$

(4 marks)

Answer _____

6

- a. In science, the distance s metres travelled by a cart is given by

$$s = ut + \frac{1}{2}at^2$$
 Work out s when $u = 3$, $t = 4$ and $a = 2.5$
 b. To change a temperature from $^{\circ}\text{C}$ to $^{\circ}\text{F}$ you can use $F = \frac{9C}{5} + 32$
 Ruby's thermometer reads 25°C . Change this temperature to $^{\circ}\text{F}$.

(3 marks)

Answer _____

7

a. Expand and simplify $3(x + 2) + 2(x - 5)$ b. Solve $5(x - 3) = 20$

(4 marks)

Answer _____

8

a. Write down the highest common factor of $6x^2y$ and $9xy$ b. Factorise $8a - 12$ c. Factorise fully $10x^2y + 15xy^2$

(4 marks)

Answer _____

9

a. Expand and simplify $(x + 9)(x - 2)$ b. Factorise $x^2 - 3x - 28$

(4 marks)

Answer _____

10 A rectangular garden is $(x + 4)$ metres long and $(x + 1)$ metres wide.

- Write an expression for the perimeter of the garden. Give your answer in its simplest form.
- Show that the area of the garden is $(x^2 + 5x + 4) \text{ m}^2$.
- Work out the area of the garden when $x = 6$

(4 marks)

Answer _____

11 a. Simplify $t^8 \div t^3$

b. Simplify $(k^4)^5$

c. Simplify $\frac{12x^6y^3}{4x^2y}$

(3 marks)

Answer _____

EXTENSION QUESTIONS

12 a. Simplify $4a^2b \times 3ab^3$

b. Simplify $20p^5q^2 \div 4p^2q$

c. Expand and simplify $(3x + 2)(2x - 5)$

(4 marks)

Answer _____

13 Expand and simplify $(x + 2)(x + 3)(x + 4)$

(3 marks)

Answer _____

14

Solve $2x^2 + 5x - 12 = 0$

(3 marks)

Answer

End of questions | Total 51 marks