

Laws of Indices in Algebra

For AQA GCSE Mathematics (8300) • Foundation tier

Name _____

Total marks: **31**

Answer **all** questions in the spaces provided. Show your working: marks are given for correct method.

1 Simplify fully

(a) $y \times y \times y \times y$

[1 mark]

Answer _____

(b) $a^3 \times a^4$

[1 mark]

Answer _____

(c) $b^9 \div b^3$

[1 mark]

Answer _____

(d) $(c^2)^5$

[1 mark]

Answer _____

2 Circle the expression that is equal to m^8

[1 mark]

$$m^2 \times m^4$$

$$(m^4)^2$$

$$m^{16} \div m^2$$

$$m^4 + m^4$$

3 Simplify fully $4m^3 \times 2m^5$

[2 marks]

Answer _____

4 Ruari simplifies $20x^{10} \div 5x^2$
Here is his working.

$$20 \div 5 = 4$$

$$10 \div 2 = 5$$

$$\text{Answer } 4x^5$$

(a) Ruari's answer is wrong.
Describe the mistake he has made.

[1 mark]

(b) Simplify $20x^{10} \div 5x^2$ correctly.

[2 marks]

Answer _____

5 Simplify fully $12x^7 \div 4x^3$

[2 marks]

Answer _____

6 Simplify fully $(2a^3)^2$

[2 marks]

Answer _____

7 Work out the value of n in each of these.

(a) $m^4 \times m^n = m^{11}$

[1 mark]

$n =$ _____

(b) $(k^3)^n = k^{15}$

[1 mark]

$n =$ _____

(c) $p^{10} \div p^n = p^6$

[1 mark]

$n =$ _____

8 (a) Write down the value of y^0

[1 mark]

Answer _____

(b) Simplify $a^5 \div a^5$

[1 mark]

Answer _____

9 Simplify fully $2a^2b \times 3ab^4$

[2 marks]

Answer _____

10 Tick **one** box for each statement.

[2 marks]

$$x^2 \times x^3 = x^6$$

$$(x^2)^3 = x^6$$

$$x^8 \div x^4 = x^2$$

$$x \times x^4 = x^5$$

True

☐☐☐☐

False

☐☐☐☐

11 Simplify fully $\frac{a^4 \times a^6}{a^5}$

[2 marks]

Answer _____

- 12** A square has sides of length $3x^2$ cm.

Work out an expression for the area of the square.
Give your answer in its simplest form.

[2 marks]

Answer _____ cm^2

- 13** Simplify fully $\frac{10x^5y^3}{2x^2y}$

[2 marks]

Answer _____

- 14** Here is an identity.

$$(ax^5)^3 \equiv 64x^b$$

a and b are whole numbers.

Work out the values of a and b .

[2 marks]

$a =$ _____ $b =$ _____