

Indices Surds Standard Form

GCSE Maths · Written to the shared content for AQA, Edexcel and OCR

Name _____ Class _____ Date _____

1. Worked example

Simplify $(x^4)^3 \times x^2$.

Step 1 · Power of a power

$$(x^4)^3 = x^{12}$$

Step 2 · Multiply: add the powers

$$x^{12} \times x^2 = x^{14}$$

Answer: x^{14}

Check: $x = 2$: $(16)^3 \times 4 = 16\,384 = 2^{14} \checkmark$

2. Now try one with the steps

Simplify $6x^5y^2 \times 3x^2y$.

Step 1 · Multiply the numbers

Step 2 · Add the powers of each letter separately

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. Simplify $x^5 \times x^3$. [1]

2. Simplify $x^9 \div x^4$. [1]

3. Simplify $(y^2)^5$. [1]

4. Write down the value of 5^0 . [1]

5. Work out 3^{-2} fraction. [1]

6. Simplify $4a^3 \times 5a^4$. [2]

7. Simplify $15m^8 \div 3m^2$. [2]

8. Simplify $(3x^2)^3$. [2]

9. Write $2^5 \times 2^{-2}$ single power of 2. [1]

10. Simplify $x^{-3} \times x^5$. [1]

11. Write $1/x^4$ power of x. [1]

12. Simplify $(2a^{-1})^2$. [2]

13. Find n if $3^n \times 3^2 = 3^7$. [1]

14. Write 8×4^2 single power of 2. [2]

15. Simplify $(x^2y^{-3})^2 \div (xy^{-1})$. [3]

4. Before you hand it in

$$2^3 \times 3^2 = 6^5$$

The laws only work with the same base. Work it out: $8 \times 9 = 72$.

$$x^5 \times x^3 = x^{15}$$

Multiplying terms → ADD the powers: x^8 . Multiply powers only for a power of a power, $(x^5)^3 = x^{15}$.

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

Every factor inside the bracket is cubed: $3^3x^6 = 27x^6$.

$$3^{-2} = \frac{1}{9}$$

A negative power means a reciprocal: $3^{-2} = 1/3^2 = 1/9$.