

13 - Powers and standard form

Indices

Rules:

$$a^{m/n} = \sqrt[n]{a^m} = (\sqrt[n]{a})^m$$

Remember - When you have a bracket, use the indice with all the values

$$(4P^4)^2 = 16P^8$$

Bidmas:

$$\frac{a}{b}(x)^{-n} = \frac{a}{b} \times \frac{1}{x^n}$$

Standard Form

$$1 \leq x < 10$$

1×10^2 — 2 = number of 0s after the integer

1×10^{-2} — -2 = number of 0s in front of 1 - including one before decimal

Multiplying Standard Form

Works like Indices

1. Multiply Integers
2. Multiply powers of 10
3. Simplify if necessary

$$\begin{aligned} \text{or } (4 \times 10^5)^2 &= 4^2 \times 10^{10} \\ &= 16 \times 10^{10} \\ &= 1.6 \times 10^{11} \end{aligned}$$

$$3 \times 10^6 \times 4 \times 10^{-2}$$

$$3 \times 4 = 12$$

$$10^6 \times 10^{-2} = 10^4$$

$$12 \times 10^4 \longrightarrow 1.2 \times 10^5$$

$$1. a^m \times a^n = a^{m+n}$$

$$2. a^m \div a^n = a^{m-n}$$

$$3. a^{-m} = \frac{1}{a^m}$$

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

$$5. \left(\frac{a}{b}\right)^{-m} = \left(\frac{b}{a}\right)^m$$

$$6. a^0 = 1$$

$$7. a^1 = a$$