



Air maths tuition

Interact, engage and perform

## All you need to know about Indices (Summary)

$x^n$  means  $x$  multiplied repeatedly by itself  $n$  times.

So  $x^3 = x \times x \times x$   
So  $2^3 = 2 \times 2 \times 2 = 8$

$x^m x^n = x^{m+n}$      $x^2 \times x^3 = \underbrace{x \times x}_2 \times \underbrace{x \times x \times x}_3 = x^5$

$3^2 \times 3^3 = 3^5 = 243$

$(x^m)^n = x^{mn}$     So  $(3^2)^4 = 3^8$

$(x^m y^n)^p = x^{mp} y^{np}$     So  $(2x^3 y^2)^4 = 2^4 x^{12} y^8 = 16x^{12}y^8$

$\frac{x^m}{x^n} = x^{m-n}$     So  $\frac{x^5}{x^2} = \frac{\cancel{x} \cancel{x} \cancel{x} \cancel{x} \cancel{x}}{\cancel{x} \cancel{x}} = x^3$

$\frac{x^3}{x^5} = \frac{\cancel{x} \cancel{x} \cancel{x}}{\cancel{x} \cancel{x} \cancel{x} \cancel{x} \cancel{x}} = \frac{1}{x^2} = x^{-2}$

$x^0 = 1$      $\frac{x^2}{x^2} = \frac{\cancel{x} \cancel{x}}{\cancel{x} \cancel{x}} = 1$

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

$x^{\frac{m}{n}} = (\sqrt[n]{x})^m$     So  $x^{2/3} = (\sqrt[3]{x})^2$

So  $32^{3/5} = (\sqrt[5]{32})^3 = 2^3 = 8$

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