

# EXPONENTS AND SURDS

## Rule

## Example

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

$$2^4 \times 2^2 = 2^6 (= 64)$$

$$\frac{a^m}{a^n} = a^{m-n}$$

$$\frac{x^7}{x^3} = x^4$$

$$(a^m)^n = a^{mn}$$

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

$$(ab)^m = a^m b^m$$

$$(3a)^2 = 9a^2$$

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

$$\left(\frac{x}{2}\right)^3 = \frac{x^3}{8}$$

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

$$3^{-4} = \frac{1}{3^4} = \frac{1}{81}$$

$$a^1 = a$$

$$5^1 = 5$$

$$a^0 = 1$$

$$10^0 = 1$$

$$\sqrt[n]{a} = a^{\frac{1}{n}}$$

$$\sqrt[3]{x} = x^{1/3}$$

$$\sqrt[n]{a^n} = a$$

$$\sqrt[4]{a^4} = a$$

$$\sqrt[n]{ab} = \sqrt[n]{a} \sqrt[n]{b}$$

$$\sqrt{9a^4} = \sqrt{9} \cdot \sqrt{a^4} = 3a^2$$

$$\sqrt[n]{\frac{a}{b}} = \frac{\sqrt[n]{a}}{\sqrt[n]{b}}$$

$$\sqrt[3]{\frac{27}{b^6}} = \frac{\sqrt[3]{27}}{\sqrt[3]{b^6}} = \frac{3}{b^2}$$

$$\sqrt[m]{\sqrt[n]{a}} = \sqrt[mn]{a}$$

$$\sqrt[3]{\sqrt[2]{x}} = \sqrt[6]{x}$$