

chapter

7

Algebra 3

Section 7.6 Indices

Squares
CubesPowers
Exponents

Roots

PROJECT MATHS
Text & Tests 6

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Indices Rules	
$a^n \times a^m = a^{n+m}$	$2^2 \times 2^5 = (2)(2) \times (2)(2)(2)(2)(2)$ $= 2^7$
$\frac{a^n}{a^m} = a^{n-m}$	$\frac{2^6}{2^3} = \frac{(2)(2)(2)(\cancel{2})(\cancel{2})(\cancel{2})}{(\cancel{2})(\cancel{2})(\cancel{2})} = 2^3$
$(a^n)^m = a^{nm}$	$(2^3)^2 = (2^3)(2^3) = 2^6$
$\sqrt[n]{a} = a^{\frac{1}{n}}$	$\sqrt{2} = 2^{\frac{1}{2}}$ $\sqrt[3]{2} = 2^{\frac{1}{3}}$
$a^1 = a$	$\frac{2^1}{3^1} = \frac{2}{3}$
$a^0 = 1$	$\frac{2^0}{(-5)^0} = \frac{1}{1}$

Reciprocal

eg.1 What is the reciprocal of $2/3$?

X^{-1}

$(\frac{3}{2})^{-1} = \frac{2}{3}$

$\frac{1}{X}$

eg.2 $(2)^{-1} = \frac{1}{2}$

eg.3 $(3)^{-2} = \frac{1}{3^2} = \frac{1}{9}$

eg.4 $9^{-\frac{1}{2}} = \frac{1}{9^{\frac{1}{2}}} = \frac{1}{\sqrt{9}} = \frac{1}{3}$

eg.5 $8^{-\frac{2}{3}} = (\frac{1}{\sqrt[3]{8}})^2 = \frac{1}{2^2} = \frac{1}{4}$

Reciprocal

power

root

$$8^{-\frac{2}{3}} = \frac{1}{(\sqrt[3]{8})^2}$$

$$= \frac{1}{2^2} = \frac{1}{4}$$

$$\begin{aligned} \text{eg } 1 & \quad (2 \times 3)^2 \\ & \quad = (2 \times 3)(2 \times 3) = 2^2 \times 3^2 \end{aligned}$$

$$\text{eg } 2 \quad \sqrt{\frac{9}{36}} = \frac{\sqrt{9}}{\sqrt{36}} = \frac{3}{6} = \frac{1}{2}$$

$$\text{eg } 3 \quad \sqrt{4 \times 3} = \sqrt{4} \sqrt{3} = 2\sqrt{3}$$