

Thursday, 2 November 2023

Laws of Indices

Product Law

$$\begin{aligned}x^3 \times x^4 \\&= x^{3+4} \\&= x^7\end{aligned}$$

Quotient Law

$$\begin{aligned}x^8 \div x^5 \text{ or } \frac{x^8}{x^5} \\&= x^{8-5} \\&= x^3\end{aligned}$$

Zero Law

$$\begin{aligned}x^0 \\&= 1\end{aligned}$$

Negative Power Law

$$\begin{aligned}x^{-5} \\&= \frac{1}{x^5}\end{aligned}$$

Eg

$$\begin{aligned}3^{-2} \\&= \frac{1}{3^2} \\&= \frac{1}{9}\end{aligned}$$

Power Law

$$\begin{aligned}(x^5)^4 \\&= x^{5 \times 4} \\&= x^{20}\end{aligned}$$

Fraction Law

The diagram shows a flower with a stem and roots. An arrow points from the flower to the expression $x^{\frac{2}{3}}$. Another arrow points from the roots to the expression $\sqrt[3]{x^2}$. A curved arrow connects the two expressions, indicating their equivalence.

$$x^{\frac{2}{3}} = \sqrt[3]{x^2}$$

Negative Indices

Pg 322 Ex 18B

a) $5^{-3} = \frac{1}{5^3} = \frac{1}{5 \times 5 \times 5} = \frac{1}{125}$

b) $6^{-1} = \frac{1}{6}$

c) $10^{-5} = \frac{1}{10^5} = \frac{1}{100,000}$