7th – Exponents & Power - I

EXPONENTS OF RATIONAL NUMBER:

1. Express the following in the exponential form and also write their respective base exponent:

a) $\frac{3}{8} \times \frac{3}{8} \times \frac{3}{8} \times \frac{3}{8} \times \frac{3}{8}$ b) $\left(-\frac{2}{3}\right) \times \left(-\frac{2}{3}\right) \times \left(-\frac{2}{3}\right)$

2. Express the following as rational numbers:

a) $\left(\frac{5}{7}\right)^3$ b) $\left(-\frac{3}{4}\right)^4$

3. Express the following rational numbers in exponential form.

a) $\frac{8}{125}$ b) $-\frac{144}{169}$

LAWS OF EXPONENTS:

Law I: if x is any rational number ($x \neq 0$), and m and n are positive integers then, $x^m \times x^n = x^{m+n}$.

1. Simplify: $3^5 \div 3^2$.

2. Simplify $\left(\frac{2}{3}\right)^6 \div \left(\frac{2}{3}\right)^4$ and express the result in exponential form.

3. Find the value of $\left(\frac{-3}{4}\right)^3 \div \left(\frac{-3}{4}\right)^4$.

Law II: if x be any rational number ($x \neq 0$), m and n be positive integers such that m > n then $x^m \div x^n = x^{m-n}$.

1. Simplify and express the result as a rational number.

$\left(\frac{5}{7}\right)^4 \div \left(\frac{5}{7}\right)^2$

2. Simplify $\left(\frac{3}{7}\right)^4 \div \left(\frac{3}{7}\right)^6$ and express the result in exponential form.

3. Find the value of $\left(\frac{-2}{5}\right)^5 \div \left(\frac{-2}{5}\right)^2$.

Law III: if x be any rational number ($x \neq 0$) , m and n be positive integers such that m < n then $x^m \div x^n = \frac{1}{x^{n-m}}$.

1. Solve:

a) $2^3 \div 2^3$ b) $(-3)^2 \div (-3)^2$ c) $\left(-\frac{4}{5}\right)^4 \div \left(-\frac{4}{5}\right)^4$

2. Find the value of :

a) $\left(\frac{5}{7}\right)^4 \div \left(\frac{5}{7}\right)^6$ b) $\left(\frac{-3}{5}\right)^2 \div \left(\frac{-3}{5}\right)^5$

Law IV: if x is non -zero rational number, then $x^0 = 1$.

1. Simplify: $(2^3)^2$

2. Simplify, $[(-\frac{1}{3})^2]^3$ and express the results in exponential form.

3. Solve: $2^3 \times 4^3$

Law V: if x be any rational number, $x \neq 0$ and m ,n be positive integers, then $(x^m)^n = x^{m \times n} = x^{mn}$

1. Find the value of x so that $[\left(\frac{2}{5}\right)^3]^2 = \left(\frac{2}{5}\right)^{2x}$.

2. Evaluate: $\left(\frac{2}{3}\right)^2 \times \left(\frac{5}{3}\right)^2$

Law VI: if x be any rational number ($x \neq 0$) and m be positive integer, then $x^{-m} = \frac{1}{x^m}$ i.e., is the reciprocal of x^m.

1. Convert negative exponents to positive exponents in the following:

a) $\left(\frac{3}{4}\right)^{-2}$ b) $\left(-\frac{2}{5}\right)^{-6}$ c) $\left(-\frac{3}{7}\right)^{-11}$

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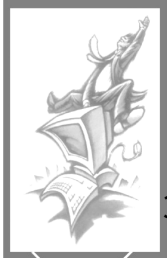

2. Simplify:

a) $\left(\frac{2}{7}\right)^{-3} \div \left(\frac{2}{7}\right)^{-2}$

3. Find the value of the following:

a) $\left(\frac{2}{3}\right)^{2} \times \frac{4}{9}$

b) $\left(\frac{-2}{5}\right)^{4} \times \frac{-2}{5}$

c) $\frac{3^3+2^0+1^0}{5^2+5}$

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