

5. Power of a Quotient

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

Examples:

$$a. \left(\frac{2}{3a}\right)^{m-1} = \frac{2^{m-1}}{(3a)^{m-1}} \text{ or } \frac{2^{m-1}}{3^{m-1}a^{m-1}}$$

$$b. \left(\frac{3x^2}{2y^4}\right)^2 = \frac{9x^4}{4y^8}$$

$$c. \left(\frac{7^{x+1}}{7^{x-1}}\right) = (7^2)^2 = 7^4 = 2401$$

6. Negative Exponent

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

where $a, n \in \mathbb{R}$
& $a \neq 0, n \neq 0$

Examples:

$$a. \frac{a^4 b^5}{a^3 b^4} = \frac{b^4 b}{a^3 a^4} = \frac{b^5}{a^7}$$

$$b. 2a^{-4} = \frac{2}{a^4}$$

$$c. (2a)^{-4} = \frac{1}{(2a)^4} = \frac{1}{16a^4}$$

7. ZERO Exponent

$$a^0 = 1, \text{ where } a \in \mathbb{R} \text{ \& } a \neq 0$$

Examples:

$$a. 2a^0 = 2$$

$$b. (2a)^0 = 1$$

$$c. -a^0 = -1$$