

SUMMARY OF EXPONENT RULES

MULTIPLICATION
RULE

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

EX) $(x^4 y^3)(x^5 y) = x^9 y^4$

EX) $8^3 \cdot 8^7 = 8^{10}$

DIVISION
RULE

($m > n$)

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

EX) $\frac{x^8}{x^3} = x^5$

EX) $\frac{5^{12}}{5^4} = 5^8$

ZERO EXPONENT
RULE

(DIVISION RULE
WHERE $m = n$)

$$a^0 = 1$$

EXCEPT FOR
 $0^0 = 0$

EX) $(4x^3 y)^0 = 1$

EX) $5^0 = 1$

NEGATIVE EXPONENT
RULE

(DIVISION RULE
WHERE $m < n$)

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

EX) $5^{-2} = \frac{1}{5^2} = \frac{1}{25}$

EX) $4x^{-3} = 4 \cdot \frac{1}{x^3} = \frac{4}{x^3}$

💡 NEVER LEAVE A
NEGATIVE EXPONENT

POWER TO A POWER
RULE

$$(a^m)^n = a^{m \cdot n}$$

EX) $(5^2)^5 = 5^{10}$

EX) $[(4^3)^2]^6 = [4^6]^6 = 4^{36}$

GROUP TO A POWER
RULE

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

($\frac{a}{b}$)ⁿ OR

$$= \frac{a^n}{b^n}$$

EX) $(4x)^2 = 4^2 x^2 = 16x^2$

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