Dividing With Exponents

Remember: Expanding & Simplifying

Ex:) $\frac{x^8}{x^3} = x^{8-3} = x^5$

$\boxed{x^5}$

$\frac{x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x}{x \cdot x \cdot x} = \frac{x \cdot x \cdot x \cdot x \cdot x}{1} = \frac{x^5}{1}$

$\boxed{x^5}$

Ex:) $\frac{2^5}{2^9} = 2^{5-9} = 2^{5+(-9)} = 2^{-4} = \frac{1}{2^4}$

$\boxed{\frac{1}{16}}$

$\frac{2 \cdot 2 \cdot 2 \cdot 2 \cdot 2}{2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2} = \frac{1}{2 \cdot 2 \cdot 2 \cdot 2} = \frac{1}{16}$

$\boxed{\frac{1}{16}}$

Ex:) Simplify using the rule & by expanding

$\frac{3^7}{3^{12}} = 3^{7-12} = 3^{-5} = \frac{1}{3^5}$

$\boxed{\frac{1}{243}}$

$\frac{3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3}{3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3} = \frac{1}{3 \cdot 3 \cdot 3 \cdot 3 \cdot 3} = \frac{1}{243}$

$\boxed{\frac{1}{243}}$

WHAT DO WE DO WITH A NEGATIVE EXPONENT IN THE DENOMINATOR POSITION?

$$\frac{1}{x^{-4}}$$

$$\frac{1}{x^{-4}} \leftarrow \div$$

$$1 \div x^{-4}$$

$$1 \div \frac{1}{x^4}$$

$$\frac{1}{1} \div \frac{1}{x^4}$$ KEEP CHANGE FLIP

$$\frac{1}{1} \times \frac{x^4}{1}$$

$$\frac{x^4}{1}$$ ← IT BECOMES POSITIVE IN THE NUMERATOR POSITION

$$\boxed{x^4}$$

Ex:) SIMPLIFY:

$$\frac{a^{-2}b^3}{c^0 d^{-5}}$$

$$\frac{a^{-2}b^3}{1 \cdot d^{-5}}$$

$$\frac{b^3 d^5}{1 \cdot a^2}$$

$$\boxed{\frac{b^3 d^5}{a^2}}$$

QYO:) $$\frac{w^{-4}x^0}{y^{-7}z}$$

$$\frac{w^{-4}x^0}{y^{-7}z} \quad (x^0 = 1)$$

$$\frac{y^7 \cdot 1}{w^4 z}$$

$$\boxed{\frac{y^7}{w^4 z}}$$