Name:_____

U3:L5 Dividing Polynomials

Just like <u>multiplication</u> of polynomials, division **does not** require you to combine **like terms**.

Instead, you will divide **coefficients** and **variables** by themselves.

Just as with multiplication, variables **do not** need to be separated by **degree**

Dividing Polynomials by a Constant

Examples:

$$(3f^2 - 12fg + 9g^2) \div 3$$

$$\frac{3f^2 - 12fg + 9g^2}{3}$$

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

✓ Re-write as a fraction:

Split the fraction into the sum of 3 fractions:

$$\frac{3f^2}{3} - \frac{12fg}{3} + \frac{9g^2}{3}$$

$$f^2 - 4fg + 3g^2$$

Find 3 quotients and combine final answer:

$$\boxed{f^2 - 4fg + 3g^2}$$

$$\frac{15gh + 45g^2 - 100h}{-5}$$

Split the fraction into the sum of 3 fractions:

$$\frac{15gh}{-5} + \frac{45g^2}{-5} - \frac{100h}{-5}$$

$$\boxed{-3gh - 9g^2 + 20h}$$

Find 3 quotients and combine final answer:

$$-3gh + (-9g^2) - (-20h)$$

Dividing a Polynomial by a Monomial

$$\dfrac{16x^3y^3}{-8xy}$$

Split the quotient expression into the ~~sum~~ product of fractions:

$$\frac{16}{-8} \times \frac{x^3}{x^1} \times \frac{y^3}{y^1}$$

Divide each:

$$-2 \times x^{3-1} \times y^{3-1}$$

$$-2 \times x^2 \times y^2$$

Combine your final answer:

$$\boxed{-2x^2y^2}$$

Another one...

$100x^2yz \div 25xyz^2$ $\longrightarrow$ $\dfrac{100x^2yz^3}{25xyz^2}$

Split the quotient expression into the ~~sum~~ product of fractions:

product

$$\dfrac{100}{25} \times \dfrac{x^2}{x^1} \times \dfrac{y^1}{y^1} \times \dfrac{z^3}{z^2}$$

Divide each:

$$4 \times x^{2-1} \times y^{1-1} \times z^{3-2}$$

$$4 \times x^1 \times y^0 \times z^1$$

Combine your final answer:

$$\boxed{4xz}$$