2.5: Multiplying/Dividing Monomials

To multiply monomials:

1) Multiply the numerical coefficients together.
2) Multiply the "like" variables together (use your power rules). Repeat for each different variable in the question.

Ex1) Simplify.

a) $(4x^2)(5x^3)$

$= 20x^5$

b) $(-7y^8)(3y^4)$

$= -21y^{12}$

c) $(a^2b^5)(a^4b^6)$

$= a^6b^{11}$

d) $(-5x^3y^4)(8x^6y)$

$= -40x^9y^5$

e) $(-a^4b^5)(-7ab^3)$

$= 7a^5b^8$

f) $(6p^2q^3r^8)(3p^3qr^2)$

$= 18p^5q^4r^{10}$

g) $(2x^2)(-3yz)$

$= -6x^2yz$

h) $(-2e^3f)(3ef^2)(-4e^2f^3)$

$= 24e^6f^6$

Note: $b^0 \neq 0$ $b^0 = 1$

$a \Rightarrow a^1$

To divide monomials:

1) Divide the numerical coefficients.
2) Divide the "same" variables (use your power rules). Repeat for each different variable in the question.

Ex2) Simplify.

a) $\frac{15x^5}{3x^2}$

$= 5x^3$

b) $\frac{-24a^8}{6a^2}$

$= -4a^6$

c) $\frac{a^5b^4}{ab^3}$

$= a^4b$

d) $\frac{10x^6y^3}{5x^4y^2}$

$= 2x^2y$

e) $\frac{-18x^5y^8}{12x^3y^6}$

$= -\frac{3}{2}x^2y^2$

f) $\frac{2a^6b^2}{12a^3}$

$= \frac{1}{6}a^3b^2$

g) $\frac{-45a^3b^2}{-9a^3b}$

$= 5a^0b$

$= 5b$

Ex 3) Dividing a Polynomial by a Monomial

$\frac{25x^2y - 5xz}{5x}$

Recall: $\frac{a+b}{c} = \frac{a}{c} + \frac{b}{c}$

$= \frac{25x^2y}{5x} - \frac{5xz}{5x}$

$= 5xy - z$

More Practice:

Ex 4) Divide:

a) $\frac{25xy-15y^2}{5}$

$= \frac{25xy}{5} - \frac{15y^2}{5}$

$= 5xy - 3y^2$

b) $\frac{25x^2y^2-30xy^4+35x^3y}{5xy}$

$= 5xy - 6y^3 + 7x^2$