Dividing Monomials/Polynomials

Laws of Exponents Relating To Division

When dividing like bases, keep the base and **subtract** the exponents.

$$x^a \div x^b = x^{a-b}$$

Examples:

1) $x^9 \div x^5 =$ _____

2) $y^5 \div y =$ _____

3) $c^5 \div c^5 =$ _____

4) $10^5 \div 10^3 =$ _____

5) $y^{6b} \div y^{4b} =$ _____

Dividing a Monomial by a Monomial

PROCEDURE. To divide monomials:

1. Divide their numerical coefficients.
2. When variable factors are powers with the same base, divide by subtracting exponents.
3. Multiply (combine) the quotients obtained in steps 1 and 2.

Examples:

1) Divide 18x by 2

2) Divide $14x^2y^2$ by -7

3) $(8cd) \div (-4c)$

4) $\dfrac{15(c-d)}{-5(c-d)}$

5) $\dfrac{-27xyz}{-9xz}$

6) $15c^4d \div -5c^3d$

7) $\dfrac{10x^2y^{-5}}{5y^2}$

8) $\dfrac{4x^3y^{-2}}{6x^{-1}y^3}$

9) $\dfrac{3x^3y^5z}{9x^4y^3}$

Dividing a Polynomial by a Monomial

PROCEDURE. To divide a polynomial by a monomial, divide each term of the polynomial by the monomial.

Examples:

1) $(8a^5 - 6a^4) \div 2a^2 =$ _____

2) $\dfrac{21a^2b - 3ab}{3ab} =$ _____

3) $\dfrac{24x^3y^4 - 18x^2y^2 - 6xy}{-6xy} =$ _____

4) $\dfrac{15y^4 - 12xy^3}{3y^2} =$ _____

5) $\dfrac{4m^2n^2 + 6m^3n - 2m^2n^2}{2m^2n} =$ _____

Extra Practice:

1) $(12a^5 + 2a^3) \div 2a^2$

2) $\dfrac{-49c^4b^3}{7c^2b^2}$

3) $\dfrac{mn - n}{n}$

4) $\dfrac{18d^3 + 12d^2}{6d}$

5) $\dfrac{25b^5 + 15b^4 - 5b^2}{5b^2}$

6) $\dfrac{12x^4 + 15x^{-3} - 24x^{-1}}{3x^2}$

7) $\dfrac{\pi r^2 + \pi r}{\pi r}$

8) $\dfrac{2.4y^5 + 1.2y^4 - 0.6y^3}{-0.6y^3}$