Section 5-1: Monomials

Lesson 16

Objective:

- Simplify Monomials with negative exponents.

Lesson 16: Monomials Negative Exponents

~ Rule ~

Negative Exponents: For any real number a, and any integer n, where $a \neq 0$

$$\boxed{a^{-n} = \frac{1}{a^n} \; or \; \frac{1}{a^{-n}} = a^n}$$

For example: $\frac{1}{x^2}$ ***can be written as*** x^{-2}

* If the instructions say "Simplify", no neg exponents.

Lesson 16: Monomials Negative Exponents

Example: Write the expression in a different way

1. $\frac{1}{x^{25}} = x^{-25}$

2. $5y^{-7} = \frac{5}{y^7}$

ex: $(5y)^{-7} = \frac{1}{(5y)^7}$

Properties of Powers

Suppose m and n are integers and a and b are real numbers. Then the following properties hold.

Power of a Power: $(a^m)^n = a^{mn}$

Power of a Product: $(ab)^m = a^m b^m$

Power of a Quotient: $\left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^{n}$ or $\frac{b^n}{a^n}, a \neq 0, b \neq 0$

Lesson 16: Monomials Negative Exponents

Simplify each expression by rewriting without parentheses or negative exponents.

Ex 1: $3x^{-4}$ $= \boxed{\frac{3}{x^4}}$

Lesson 16: Monomials Negative Exponents

Simplify.

Ex 2: $5^{-2}x^{-3}\cancel{y^{0}}^{\,1} = \frac{1}{5^2 x^3} = \boxed{\frac{1}{25x^3}}$

Lesson 16: Monomials Negative Exponents

Simplify.

Ex 3: $\dfrac{-6a^4}{2a^{-2}} = -3a^4a^2 = \boxed{-3a^6}$

$= -3a^{4+2} = -3a^6$

Lesson 16: Monomials Negative Exponents

Simplify.

Ex 4: $\dfrac{8m^3n^2}{-4m^{-1}n^3} = \dfrac{-2m^3m^1n^2}{n^3} = \boxed{\dfrac{-2m^4}{n}}$

Lesson 16: Monomials Negative Exponents

Simplify.

Ex 5: $\dfrac{8w^{-5}x^4}{(2w^3x^3)^0} = \dfrac{8w^{-5}x^4}{1} = \boxed{\dfrac{8x^4}{w^5}}$

Lesson 16: Monomials Negative Exponents

Simplify.

Ex 6: $\left(\frac{-4}{n}\right)^{-3}$ $= \left(\frac{n}{-4}\right)^{3} = \frac{n^3}{(-4)^3} = \boxed{\frac{n^3}{-64}}$

$\boxed{-\frac{n^3}{64}}$

$\left(\frac{-4}{n}\right)^{-3} = \frac{(-4)^{-3}}{n^{-3}} = \frac{n^3}{(-4)^3} =$

Assignment 16

Due next class period

Memorize Exponents for quiz (on lesson 20 day).