9/20/2012. Sec 5.1 (cont.) Sec 5.2 Math 1010

#125

#115

#125 $\left(\dfrac{-3x^4y^6}{15x^{-6}y^{11}}\right)^{-3}$

$\left(\dfrac{-3x^4x^6}{15y}\right)^{-3}$

$\left(\dfrac{-1}{\cancel{-3}\,x^{10}}{\cancel{15}\,y}\right)^{-3}$

$\left(\dfrac{-1x^{10}}{5y}\right)^{-3} = \dfrac{(-1x^{10})^{-3}}{(5y)^{-3}} = \dfrac{(-1)^{-3}(x^{10})^{-3}}{(5)^{-3}(y)^{-3}}$

$= \dfrac{-1\,x^{-30}}{5^{-3}\,y^{-3}}$

$= \dfrac{-1\cdot 5^3\,y^3}{x^{30}}$

$= \dfrac{-1\cdot 125\,y^3}{x^{30}} = \boxed{\dfrac{-125\,y^3}{x^{30}}}$

#115

$$\frac{(2k)^2 k^3}{k^{-1} k^{-5}} (5k^{-2})^{-3}$$

$$\frac{(2k)^2 k^3}{k^{-6}} (5k^{-2})^{-3}$$

$$(2k)^2 k^3 k^6 (5k^{-2})^{-3}$$

$$(2k)^2 k^9 (5k^{-2})^{-3}$$

$$2^2 k^2 k^9 5^{-3} k^6$$

$$2^2 \cdot 5^{-3} k^{17}$$

$$\frac{2^2 k^{17}}{5^3}$$

$$\boxed{\frac{4k^{17}}{125}}$$

Sec 5.1 (cont.)

Scientific Notation

a Number expressed in the form $a \times 10^n$, where $1 \leq |a| < 10$ and n is an integer is said to be in Scientific Notation

Ex: 2.5×10^{15}, -1.2×10^{2}

1×10^{-2}, 1.497×10^{3}

Ex Not: 43.25×10^{2}, $-.234 \times 10^{5}$

$2.7 \times 10^{3.5}$

Convert to Scientific Notation

1st Decide where the decimal needs to be moved to

2nd Count how many places to move and which direction

3rd write in Scientific Notation

Ex: 8394000.

↑ 6 places

8.394×10^{6}

Ex: $429,000,000,000$

4.29×10^{11}

$-0.00025 = -2.5 \times 10^{-4}$

$.0987 \times 10^{-2} = .0987$

153

$$\frac{0.05 \times 1600}{0.0004}$$

$$\frac{5 \times 10^{-2} \times 1.6 \times 10^{3}}{4 \times 10^{-4}}$$

$$\frac{5 \times 1.6 \times 10^{-2} \times 10^{3}}{4 \times 10^{-4}}$$

$$\frac{5 \times 1.6 \times 10^{1} \times 10^{4}}{4}$$

$$\frac{5 \times 1.6 \times 10^{5}}{4}$$

$$\frac{5 \times 0.4 \times 10^{5}}{1}$$

$$2.0 \times 10^{5} = 200{,}000$$

See 5.2 Adding and Subtracting Polynomials

Recall: A term is a number, a variable, or a product of a number and a variable raised to a power

Defn:

A polynomial in x is a term or a finite sum of terms of the form ax^n, where a is a Real Number, and n is a whole number

Ex: $3x^2+2x+5$

$2x^5$

$-2x^{19}+x^{14}+125x+2$

Ex of not

$3x^{-1}+4$, $\sqrt{x^2+2}$, $3x^2+x+2+\boxed{\frac{4}{x}}$

$4x^{-1}$

For each term of a polynomial

$\boxed{a}x^{(n)}$ ← degree of the term

↑

called the Numeral coefficient or the coefficient

$3x^2 + 2x^{(1)} + 5x^0$

↑ ↑

coefficient = 3 = 2 = 5

degree = 2 = 1 = 0

Given Polynomial

$y - 6y^3 + 8y^5 - 9y^4 + 12$

$8y^5 - 9y^4 - 6y^3 + y + 12$

↳ Leading term

within the leading term

$\boxed{8}y^{(5)}$ ← degree of polynomial

↑

leading coefficient

Monomial is a polynomial with exactly 1 term

Ex: 7, $13x^5$, $15t$

Binomial is a polynomial with exactly 2 terms

Ex: $3x+2$, $-x^{15}+x^{12}$

Trinomial is a polynomial with exactly 3 terms

Ex: $3x^2+4x+5$, y^2+2y+9,

$15x^{205}+x^{19}+5$

Polynomials may have more than one variable

Ex: $x^3+3x^2y+3xy^2+y^3$

Ex: $x^3y^9+12xy^4+7xy$

the degree of a term is the sum of the exponents on all of the variables

$x^3y^9+12xy^4+7xy$ ← degree 12

degree $=3+9=12$ degree $=1+4=5$ degree $=2$