BE-Alg.2 Tuesday 9-28-10

ACT 2009-2010 PFA

① $f(x) = 4x + 1 \quad g(x) = x^2 - 2$

$f(g(x)) = ?$

② Which number is a rational number?

(A) $\sqrt{2}$ (B) $\sqrt{\pi}$ (C) $\sqrt{7}$ (D) $\sqrt{\frac{5}{25}}$ (E) $\sqrt{\frac{64}{49}}$

③ What is the slope of the line parallel to the line $y = \frac{2}{3}x - 4$ in the standard (x, y) coordinate plane?

Ans!

① $f(x) = 4x + 1$

$f(x^2 - 2) = 4(x^2 - 2) + 1$

$= 4x^2 - 8 + 1$

$= \boxed{4x^2 - 7}$

② $\sqrt{\frac{64}{49}}$

$= \frac{\sqrt{64}}{\sqrt{49}}$

$= \boxed{\frac{8}{7}}$

Rational

③ $m_{\perp} = \boxed{\frac{2}{3}}$

- Homework review ⇒ Pg. 192 # 4, 6, 12, 13, Pg 193 # 26

④ $\boxed{(5, 1)}$ ⑥ $\boxed{(-6, -8)}$ ⑫ $\boxed{(2, -1)}$ ⑬ $\boxed{(-12, 4)}$

26 $\boxed{(-1, 3, 4)}$

Summary of Exponent Rules

Multiplication Rule

$$a^m \cdot a^N = a^{m+N}$$

Ex) $(x^4y^3)(x^5y) = x^9y^4$

Ex) $8^3 \cdot 8^7 = 8^{10}$

Division Rule ($m > N$)

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

Ex) $\frac{x^8}{x^3} = x^5$

Ex) $\frac{5^{12}}{5^4} = 5^8$

Zero Exponent Rule

(Division Rule where $m = N$)

$$a^0 = 1$$

Except for $0^0 = 0$

Ex) $(4x^3y)^0 = 1$

Ex) $5^0 = 1$

Negative Exponent Rule

(Division Rule where $m < N$)

$$a^{-N} = \frac{1}{a^N}$$

Ex) $5^{-2} = \frac{1}{5^2} = \frac{1}{25}$

Ex) $4x^{-3} = 4 \cdot \frac{1}{x^3} = \frac{4}{x^3}$

Never leave a negative exponent

Power To A Power Rule

$$(a^m)^N = a^{m \cdot N}$$

Ex) $(5^2)^5 = 5^{10}$

Ex) $\left[(4^3)^2\right]^6 = \left[4^6\right]^6 = 4^{36}$

Group To A Power Rule

$$(ab)^N = a^N b^N$$

OR

$$\left(\frac{a}{b}\right)^N = \frac{a^N}{b^N}$$

Ex) $(4x)^2 = 4^2x^2 = 16x^2$

Ex) $\left(\frac{2x}{y}\right)^3 = \frac{2^3x^3}{y^3} = \frac{8x^3}{y^3}$

Ch. 5-1 Monomials

Monomial A number, a variable, or the product of a number and (multiplication) one or more variables.

(Ex) 2, $2x$, $2x^3$, $-x$, $-xyz$, 5^{-1}, $\frac{1}{3}x$, 2^2x, $25xy^2z^3$

NOT MONOMIALS $\frac{1}{x}$, $x+y$, x^{-1}

Degree of a Monomial the sum (add) the exponents of the variables.

Monomial	Degree	
(Ex) $2x$	1	
$3x^2y$	2	
$\frac{1}{2}xyz$	3	
$5x^2y^3z^5$	10	
8	0	Constants have a degree = 0

Simplifying Monomials

- get rid of parentheses
- leave NO negative exponents

Ex1 pg 222 $(3x^3y^2)(-4x^2y^4)$

$\boxed{-12x^5y^6}$ MR

Ex2 pg 223 $\frac{p^3}{p^8}$

$p^{3-8} = p^{-5} = \boxed{\frac{1}{p^5}}$ DR, NER

Ex3 pg 224

(A) $(a^3)^6 = \boxed{a^{18}}$ PP

(B) $(-2p^3s^2)^5 = (-2)^5p^{15}s^{10}$ GP, PP

$= \boxed{-32p^{15}s^{10}}$

(C) $\left(\frac{-3x}{y}\right)^4$ Careful...

$\frac{(-3)^4x^4}{y^4} = \boxed{\frac{81x^4}{y^4}}$ GP, PP

The $(-3)^4$ is OFTEN missed.

(D) $\left(\frac{a}{4}\right)^{-3} = \frac{1}{\left(\frac{a}{4}\right)^3} = \frac{1}{\frac{a^3}{64}} = \boxed{\frac{64}{a^3}}$ NER, GP

Ex 4 / Pg 224

$$\left(\frac{-2x^{3N}}{x^{2N}y^3}\right)^4 = \left(\frac{-2x^{3N-2N}}{y^3}\right)^4$$

$$= \left(\frac{-2x^N}{y^3}\right)^4 = \frac{(-2)^4 x^{4N}}{y^{12}}$$

$$= \boxed{\frac{16x^{4N}}{y^{12}}}$$

Recall: Scientific Notation

$a \times 10^N$ where $1 \le a < 10$

And N is an integer

(Ex) $2500 = 2.5 \times 10^3$

$1{,}000{,}000 = 1 \times 10^6$

$0.003 = 3 \times 10^{-3}$

Ex 5 / Pg 225

(A) $6{,}380{,}000 = 6.38 \times 10^6$

(B) $0.000047 = 4.7 \times 10^{-5}$

Ex 6

(A) $(4 \times 10^5)(2 \times 10^7) = \boxed{8 \times 10^{12}}$

(B) $(2.7 \times 10^{-2})(3 \times 10^6) = \boxed{8.1 \times 10^4}$

(Ex) $(6\times10^{6})(8\times10^{4})$

$= 48\times10^{10}$ NOT in correct Sci. Not.

$= 4.8\times10^{11}$

↑ MAKE SMALL BY ONE PLACE ⇒ ↑ MAKE BIGGER BY ONE PLACE

(Ex) $4800\times10^{12} = 4.800\times10^{15}$

$0.005\times10^{6} = 5\times10^{3}$

$28605\times10^{-5} = 2.8605\times10^{-1}$! CAREFUL

Homework:
- Memorize the 6 Exponent rules
- Pg 226-227 #19-31 odd
  #36
  #44-58