

BE-Algebra TUESDAY 11-16-10

- ① WHAT is the Multiplication Rule for Exponents in words? As a formula?
- ② Simplify:
A $(x^3y^5z)(x^8y^3z)$
B $(-3abc)(5ab)$
C $(\frac{1}{2}xy'')(-10x^2y)$
- ③ DEFINE A MONOMIAL - Ref. Ch. 8-1
- ④ Find 2 numbers whose sum is -18 and whose difference is 32.
TIP: USE A SYSTEM OF LINEAR EQUATIONS

• Homework review: Pg. 413 # 15-26.

How could you simplify

$$(2^4)^2$$

↗
base is 2^4

$$\therefore (2^4)^2 = 2^4 \cdot 2^4 = 2^8$$

Do you see A SHORTCUT?

Power to A Power (exponent rule)	To find a power raised to A power, multiply the exponents
--	---

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

$$\textcircled{\text{EX}} \quad (3^2)^3 = 3^6$$

$$\textcircled{\text{EX}} \quad (x^4)^5 = x^{20}$$

Ex 3
Pg 411

$$\left[(3^2)^3 \right]^2$$

$$= [3^6]^2 = \boxed{3^{12}} \text{ or } 531,441$$

Simplify:

$$\textcircled{\text{Ex}} \left[(2^3)^2 \right]^6 = 2^{6 \cdot 6} = \boxed{2^{36}}$$

$$\textcircled{\text{Ex}} (x^4)(x^3)^2$$

$$(x^4)(x^6)$$

$$\boxed{x^{10}}$$

Note: (monomials)(monomials) = monomials

How could you simplify:

$$(2x)^3$$

↑
base

$$= 2x \cdot 2x \cdot 2x$$

$$= 2 \cdot 2 \cdot 2 \cdot x \cdot x \cdot x$$

$$= 2^3 x^3$$

$$= \boxed{8x^3}$$

Do you see a shortcut?

Group To A
Power
(Exponent rule)

To find the power of
A group, raise EACH factor
to a power.

GPR

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

ⓔx $(6xy^2)^2 = 6^2 x^2 y^4 = \boxed{36x^2 y^4}$

Summary

MR $a^n \cdot a^m = a^{n+m}$

PPR $(a^n)^m = a^{n \cdot m}$

GPR $(ab)^n = a^n b^n$

EXAMPLE

$x^5 x^{10} = x^{15}$

$(x^5)^{10} = x^{50}$

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

EX 5
Pg 412Simplify $(\frac{1}{3}xy^4)^2((-6y)^2)^3$

$$\left\{ \frac{1}{3} \cdot \frac{1}{3} = \frac{1}{9} \right\}$$

$$\left(\frac{1}{3}\right)^2 x^2 y^8 \cdot (-6)^2 y^2)^3$$

$$\frac{1}{9} x^2 y^8 \cdot (36 y^2)^3$$

$$\frac{1}{9} x^2 y^8 \cdot 36^3 y^6$$

$$4 \cdot 36^2 x^2 y^{14}$$

$$\boxed{5184 x^2 y^{14}}$$

$$\begin{array}{r} 36 \\ 36 \\ \hline 216 \\ 108 \\ \hline 1296 \\ \times 4 \\ \hline 5184 \end{array}$$

Homework:

Pg. 413 # 27-34