Multiplying and Power to Power with Exponents

Do Now:

$4x^2$

What is the 4 called?

What is the x called?

What is the 2 called?

Exponent Rules

monomial: one term held together by *multiplication*

Examples:

constant: all numbers

Examples:

coefficient: the number in front of the variable

$8x$ $\frac{1}{2}y$ $-1x$ $-3y$

base:

y^3 4^5 $2x^3$

base

Properties of Exponents
Multiplying

To multiply two powers that have the *same* base, keep the base and add the exponents (multiply coefficients as normal)

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

Example:

a) $2^2 \cdot 2^5 =$

b) $x^3 \cdot x^2 =$

c) $\frac{3}{4}x^4 \cdot \frac{7}{2}x =$

d) $\left(\frac{1}{2}x^4y\right) \cdot \left(\frac{4}{3}x^6y^3\right)$

e) $(-2)^3(-2)(-2)^2$

f) $(-3c^2d^2)(5c^3d)(-2c^2)$

g) $(3m^2n^5)(-8n^2m)$

Power to a Power

When raising a power to a power, multiply the exponents (**don't forget coefficients inside need to be raised to that power as well)

$$(a^m)^n = a^{m\,n}$$

Example:

a) $(x^2)^3$ =

b) $(3^5)^2$

c) $(\frac{2}{7}y^4)^2$ =

d) $((-3)^3)^2$

e) $(4x^2y)^3$ =

f) $(5m^4n^3)^3$

g) $(-3x^4)^2$=

h) $d^2 \bullet (d^3)^4$

i) $(2y^d)^2$ =

j) $(2x^2)^3(x^2y^3)^4$

k) $(-5x^{d+1})^2$ =

Let's Try a "COMBO" problem

1) $2x^3y^2\left(3x^3y^4\right)^2$

2) $8ab^6\left(\frac{1}{2}a^2b^5\right)^3$

Classwork and Homework:

1. $3x^4 \cdot 5x^2$

2. $xk \cdot 4k^6$

3. $(3x^3)^3$

4. $(5xy^4)^2$

5. $(\frac{4}{3}z^5)^2$

6. $(x^{d+1}y^3)^4$

7. $\frac{1}{2}xy^{4+d} \cdot (20x^3y^{d-9})$

8. $7x^6a^2 \cdot (3x^4) \cdot (\frac{4}{3}x^5)$

9. $4x^3y^2\left(\frac{1}{2}x^5y^7\right)^3$

10. $-\left(r^2st^3\right)^2\left(s^4t\right)^3$