Anything to the zero power = 1 (except zero to the zero power, which is undefined)

Anything to the first power = itself

Negative Exponents mean RECIPROCAL

Sec 8-3: Multiplication Properties of Exponents

When you multiply powers with the same base you

ADD EXPONENTS

Multiplying Numbers in Scientific Notation.

Give the answer to each in Scientific Notation WITHOUT A CALCULATOR

1. $(2 \times 10^6)(2.5 \times 10^4) = 5 \times 10^{10}$ (add exp; mult)
2. $(3 \times 10^{-4})(1.1 \times 10^{-8}) = 3.3 \times 10^{-12}$
3. $(6 \times 10^7)(9 \times 10^5)$ $54 \times 10^{12} = 5.4 \times 10^{13}$ (bigger; smaller)

You can now do Hwk #7

Due tomorrow

Pages: 407-408

Problems: 10, 12, 16-18, 21, 28, 40, 42

Error Analysis **Correct each error.**

44.

$$(3x^2)(-2x^4) = 3(-2)x^{2 \cdot 4}$$
$$= -6x^8$$

Add exponents don't multiply them.

$$= -6x^6$$

45.

$$4a^2 \cdot 3a^5 = (4+3)a^{2+5}$$
$$= 7a^7 = 12a^7$$

Multiply coefficients don't add them

46.

$$x^6 \cdot x^1 \cdot x^3 = x^{6+3}$$
$$= x^{10}$$

47.

$$3^4 \cdot 2^2 = 6^{4+2}$$
$$81 \cdot 4 = 324$$

Simplify each.

1. $Q^4 \cdot Q^{-3} \cdot Q^7 = Q^8$

2. $(Q^6)^3 = Q^{18} = Q^6 \cdot Q^6 \cdot Q^6 = Q^{18}$

Section 8-4: More Multiplication Properties of Exponents

Raising a Power to a Power:

$(x^a)^b = x^{a \cdot b}$ Multiply exponents

Simplify each. Write answers without negative exponents.

1. $(h^4)^3 = h^{12}$

2. $(P^{-6})^7 = \frac{1}{P^{42}}$

3. $(D^9)^{-4}$ $\left(\frac{1}{D^9}\right)^4$ $\frac{1}{D^{36}}$

4. $(B^{-3})^{-5}(B^3)^4 = B^{27}$ $B^{15} \cdot B^{12}$

Simplify

5. $(7m^3n^5)^2 = 49m^6n^{10}$

$7^2(m^3)^2(n^5)^2$

Property **Raising a Product to a Power**

For every nonzero number a and b and integer n, $(ab)^n = a^n b^n$.

Every part inside the parentheses is raised to the exponent on the outside.

6. $(3a^4b^{-3})^2(2a^2b^5)^3$

$(9a^8b^{-6}) \cdot (8a^6b^{15}) =$ $72a^{14}b^9$

Simplify each:

7. $(4m^3n^{-5})^{-2}$ $= 4^{-2}m^{-6}n^{10}$ $= \dfrac{n^{10}}{16m^6}$

8. $((8x^6y^4)^2(2xy^7))^0$

$= 1$