Homework Questions?? (Write them up here!)

(15)

a) $\underline{4 \times 10^2} \times \underline{2 \times 10^3}$

$= \underline{4 \times 2} \times 10^2 \times 10^3$

$= 8 \times 10^5$

$\hookrightarrow 8\ 00\ 000$

1.7 B Exponent Laws (Power of a Power)

Ex. 1 Write as a single power, without changing the base.

a) $(2^2)^4$

$= (2^2)(2^2)(2^2)(2^2)$

$= (2 \times 2)(2 \times 2)(2 \times 2)(2 \times 2)$

$= 2^8$

Power of a Power

A base to the power of a power is the base to the product of the exponents.

multiply the exponents.

$(m^a)^b = m^{a \times b}$

b) $(3^3)^2$

$= (3 \times 3 \times 3)(3 \times 3 \times 3)$

$= 3^6$

Ex. 2 Simplify

a) $(xy^2)^3$

$= x^3 y^6$

Power of a Product

The exponents is applied to each part of the base

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

b) $(2x^5)^4$

$= 2^4 x^{20}$

$= 16x^{20}$

Ex. 3 Simplify then evaluate if possible

a) $\left(\dfrac{2}{3}\right)^3 = \dfrac{2^3}{3^3}$

$= \dfrac{8}{27}$

Power of a Quotient

The exponents is applied to each part of the base

$\left(\dfrac{a}{b}\right)^m = \dfrac{a^m}{b^m}$

b) $\left(\dfrac{5}{x}\right)^2$

$= \dfrac{5^2}{x^2}$

$= \dfrac{25}{x^2}$

Ex 4: Simplify (using the laws of exponents)
   Be careful of the coefficients

Raise the coefficient by the exponent

Multiply the exponents

$$(4m^3)^2$$

$$= 4^2 m^6$$

$$= 16 m^6$$

Exponent Laws

SUMMARY

Simplify (using the laws of exponents)

Mutiplication	Division	Power of a Power

$3m^2 \cdot 4m^5 = 12m^7$ $\qquad$ $50m^8 \div 2m^3 = 25m^5$ $\qquad$ $\left(4m^3\right)^2 = 16m^6$

⇨ Multiply the coefficients $\qquad$ ⇨ Divide the coefficients $\qquad$ ⇨ Exponent affects **each part** of the base

⇨ add exponents $\qquad$ ⇨ subtract exponents $\qquad$ ⇨ multiply exponents

Ex. 1 Simplify

a) $\left(a^2 b^3\right)^4$

$= a^8 b^{12}$

b) $\left(-4m^2\right)^3$

$= (-4)^3 m^6$

$= -64 m^6$

BEDMAS

c) $\left(-x^3\right)^2 \left(2x^4\right)^3$

$= \left(+x^6\right)\left(8x^{12}\right)$

$= 8x^{18}$

d) $\dfrac{\left(5c^3 d\right)\left(4c^2 d^2\right)}{\left(2c^2 d\right)^2}$ ← Simplify Top ← Simplify Bottom

$= \dfrac{20 c^5 d^3}{4 c^4 d^2}$

$= 5cd$

BEDMAS

e) $\dfrac{\left(-3m^2 n^6\right)\left(2m^4 n^8\right)^3}{\left(4mn^2\right)^3}$

$= \dfrac{\left(-3m^2 n^6\right)\left(8m^{12} n^{24}\right)}{64 m^3 n^6}$

$= \dfrac{-24 m^{14} n^{30}}{64 m^3 n^6}$ ÷8 ÷8

$= -\dfrac{3}{8} m^{11} n^{24}$ OR $\dfrac{-3m^{11} n^{24}}{8}$

f) $\dfrac{\left(2m^3\right)^4}{24m^5}$

$= \dfrac{16m^{12}}{24 m^5}$ ÷8 ÷8

$= \dfrac{2}{3} m^7$ OR $\dfrac{2m^7}{3}$

gr. 10

$\dfrac{-3m^{-11} n^{24}}{8}$

$\dfrac{-3n^{24}}{8m^{11}}$

1.7B

p 127 # 5-10 (dont redo anything
you did Friday)

Handout 1.7 B

qxd