

1. Simplify the following expressions. Make sure there are no zero or negative exponents.

a. $2^{-3} = \frac{1}{2^3} = \frac{1}{8}$

b. $\frac{1}{3^{-4}} = 3^4 = 81$

c. $(-9)^{-2} = \frac{1}{(-9)^2} = \frac{1}{81}$

d. $\frac{1}{(-4)^{-3}} = (-4)^3 = -64$

e. $\frac{2x^{-4}y^{-2}}{z^{-3}} = \frac{2z^3}{x^4y^2}$

f. $\frac{c^{-2}}{d^{-3}} = \frac{d^3}{c^2}$

g. $\frac{7}{x^{-2}}$ $7x^2$

2. Simplify the following expressions.

a. $(z^1 \cdot a^1)^3 = z^3 a^3$ b. $(4xy)^2 = 4^2 16x^2y^2$ c. $(-2ab)^3 = -8a^3b^3$

d. $(2x^2y)^4 =$
 $16x^8y^4$

e. $(4g^5h^3)^2 =$
 $16g^{10}h^6$

f. $(3^2a^4b^3)^3 =$
 $3^6a^{12}b^9$
 $729a^{12}b^9$

Section 8-5:

Dividing Properties of exponents:

Dividing Powers with the Same Base:

Subtract Exponents

Simplify each.

1. $\frac{A^{24}}{A^8}$ A^{16} numerator exponent - denominator exponent:
result should be put in the NUMERATOR

2. $\frac{B^4}{B^{20}}$ $\frac{1}{B^{16}}$ denominator exponent - numerator exponent:
result should be put in the DENOMINATOR

3. $\frac{n^{-5}p^{-10}}{n^2p^{-7}} = n^{-5-2}p^{-10--7}$
 $= \frac{1}{n^7p^3}$

Raising a Quotient to a Power:

Everything on the inside of the parentheses
is raised to the exponent outside of the parentheses.

$$\left(\frac{M^4}{Q^7}\right)^2 = \frac{m^8}{Q^{14}}$$

Simplify each.

$$4. \left(\frac{a^{-4}}{b^2}\right)^3 = \frac{a^{-12}}{b^6} = \frac{1}{a^{12}b^6}$$

$$5. \left(\frac{g^{-2}h^7}{j^{-9}} \right)^{-2} = \frac{g^4 h^{-14}}{j^{18}} = \frac{g^4}{h^{14} j^{18}}$$

$$6. \left(\frac{2^{-2}a^4b^7c}{5a^{-3}b^3c^9} \right)^2 = \left(\frac{a^7b^4}{20c^8} \right)^2$$

$a^{4-(-3)}$
 b^{7-3}
 c^{1-9}

$= \frac{a^{14}b^8}{400c^{16}}$

$$\begin{aligned}
 7. \quad & \left(\frac{g^4 h^{-3} k^5}{g^8 h^{-6} k^1} \right)^{-2} \cdot \left(\frac{g^{-5} h^{-7} k^3}{g^{-2} h^4 k^{-5}} \right)^3 \\
 & \left(\frac{h^3 k^4}{g^4} \right)^{-2} \cdot \left(\frac{k^8}{g^3 h^{11}} \right)^3 \\
 & \left(\frac{g^4}{h^3 k^4} \right)^2 \cdot \frac{k^{24}}{g^9 h^{33}} \\
 & \frac{g^8}{h^6 k^8} \cdot \frac{k^{24}}{g^9 h^{33}} = \frac{k^{16}}{g^1 h^{39}}
 \end{aligned}$$

Find each quotient without a calculator. Give your answer in Scientific Notation.

$$1. \quad \frac{3.6 \times 10^9}{1.2 \times 10^2} = 3 \times 10^7$$

$$2. \quad \frac{7.5 \times 10^3}{2.5 \times 10^{11}} = 3 \times 10^{-8}$$

Simplify each.

1. $\frac{28w^8c}{14w^2c^6}$ $\frac{2w^6}{c^5}$ 2. $\frac{8k^8m^{-4}}{12k^{-3}m^{-9}}$ $\frac{2k^{11}m^5}{3}$

You can now finish Hwk #13

Sec 8-5

Pages 420-421

Problems 1-7, 34, 35, 45-47, 52

IXL #8 - V.6 & V.7 due Friday at 4pm!