

1. Simplify each of the following:

a) $(p^2)^5$

power of a power

$$= p^{(2)(5)}$$

$$= p^{10}$$

b) $4x^3 \cdot 3x^2$

first multiply coefficients

$$= 12x^3 \cdot x^2$$

$$= 12x^{3+2}$$

$$= 12x^5$$

c) $49w^7 \div (-7w^6)$

$$= -7 \frac{w^7}{w^6}$$

$$= -7w^{7-6}$$

$$= -7w$$

d) $\frac{27m^3n^5}{9m^2n^2}$

$$= \frac{27}{9} \cdot \frac{m^3}{m^2} \cdot \frac{n^5}{n^2}$$

$$= 3mn^3$$

2. Evaluate each of the following: (no calculator!)

Order of Operations is important! (BEDMAS)

a) $3^3 - 2^{-1}$

$$= 27 - \frac{1}{2}$$

$$= \frac{54}{2} - \frac{1}{2}$$

$$= \frac{53}{2}$$

b) $(5-8)^{-1}$

$$= (-3)^{-1}$$

$$= \frac{1}{(-3)^1}$$

$$= -\frac{1}{3}$$

c) -5^0

if it helps, rewrite!

$$0 - 5^0$$

$$= -1$$

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

$$= -\frac{1}{(-2)^3}$$

$$= -\frac{1}{-8}$$

$$= -(-\frac{1}{8})$$

$$= \frac{1}{8}$$

3. Simplify each of the following. Final answers with positive exponents only.

a) $\frac{a^2b^{-2}}{a^{-1}}$

$$= a^{2-(-1)} b^{-2}$$

$$= a^{2+1} b^{-2}$$

$$= a^3 b^{-2}$$

$$= \frac{a^3}{\frac{1}{b^2}}$$

$$= \frac{a^3}{b^2}$$

b) $\frac{x^{-3}}{y^{-2}}$

$$= \frac{\frac{1}{x^3}}{\frac{1}{y^2}}$$

$$= \frac{1}{x^3} \cdot \frac{y^2}{1}$$

$$= \frac{y^2}{x^3}$$

c) $\frac{1}{ab^{-4}}$

$$= \frac{1}{a} \cdot \frac{1}{b^{-4}}$$

$$= \frac{1}{a} \cdot \frac{1}{\frac{1}{b^4}}$$

$$= \frac{1}{a} \cdot \frac{b^4}{1}$$

$$= \frac{b^4}{a}$$

d) $\frac{18a^2b^{-2}}{3a^{-3}b^5}$

$$= \frac{18}{3} \cdot \frac{a^2}{a^{-3}} \cdot \frac{b^{-2}}{b^5}$$

$$= 6a^{2-(-3)} \cdot b^{-2-5}$$

$$= 6a^5 \cdot b^{-7}$$

$$= 6a^5 \cdot \frac{1}{b^7}$$

$$= \frac{6a^5}{b^7}$$