

8.3b Warm-Up:

1. Evaluate $\left(\frac{5}{2}\right)^{-3}$. = or $\frac{2^3}{5^3} = \frac{8}{125}$

2. Evaluate $4^{-7} \cdot 4^3$.

or $\frac{1}{4^7} \cdot \frac{4^3}{1} = \frac{1}{4^4} = \frac{1}{256}$

Simplify the expression.

Write your answer using only positive exponents.

1. x^{-4}

$$\frac{1}{x^4}$$

2. $2y^{-3}$

$$2y^{-3}$$

$$\boxed{\frac{2}{y^3}}$$

Simplify the expression.

Write your answer using only positive exponents.

1. $(-11h)^{-2}$

$$\frac{1}{(-11h)^2}$$

$$\frac{1}{(-1)^2 h^2}$$

$$\boxed{\frac{1}{121h^2}}$$

2. x^2y^{-3}

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

Simplify the expression.

Write your answer using only positive exponents.

a. $(2xy^{-5})^3$

$$(2^1 x^1 y^{-5})^3$$

$$2^3 x^3 y^{-15}$$

$$\frac{2^3 x^3}{y^{15}} = \boxed{\frac{8x^3}{y^{15}}}$$

$$1. \frac{y^{-2}}{y^2}$$

$$2. \frac{x^2 y^{-3}}{y^3}$$

$$3. \frac{[4x]^{-1}}{4x}$$

Simplify the expression.

Write your answer using only positive exponents.

$$\frac{3xy^{-3}}{9x^3y} = \frac{3x}{9x^3y y^3}$$

$$= \frac{3x}{9x^3y^4}$$

$$= \frac{3}{9x^2y^4}$$

$$= \frac{1}{3x^2y^4}$$

Simplify the expression.

Write your answer using only positive exponents.

$$\frac{(2x)^{-2}y^5}{-4x^2y^2} = \frac{2^{-2}x^{-2}y^5}{-4x^2y^2}$$

$$= \frac{x^{-2}y^5}{2^2(-4)x^2y^2}$$

$$= \frac{x^{-2}y^3}{2^2(-4)x^2}$$

$$\frac{y^3}{2^2(-4)x^2x^2}$$
$$\frac{y^3}{2^2(-4)x^4}$$
$$\frac{y^3}{-16x^4}$$

Simplify the expression.

Write your answer using only positive exponents.

$$\text{a. } (3x^{-2}y^2)^3 = 3^3 x^{-6} y^6$$

$$= \frac{3^3 y^6}{x^6}$$

$$= \boxed{\frac{27 y^6}{x^6}}$$

Simplify the expression.

Write your answer using only positive exponents.

$$\text{b. } \frac{4x^{-2}y^4}{8xy^6}$$

$$= \frac{4x^{-2}}{8xy^2}$$

$$= \frac{4x^{-3}}{8y^2}$$

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

The ~~order of magnitude~~ of the mass of a polyphemus moth larva when it hatches is 10^{-3} gram. During the first 56 days of its life, the moth larva can eat about 10^5 times its own mass in food. About how many grams of food can the moth larva eat during its first 56 days?

10^{-3} gram - weight @ birth
 10^5 times its mass

$\frac{1}{10^3} \cdot \frac{10^5}{1} = \frac{10^5}{10^3} = 10^2$ 100g

SCIENCE The ~~order of magnitude of the~~ mass of a proton is 10^4 times greater than ~~the order of magnitude of~~ the mass of an electron, which is 10^{-27} gram. Find ~~the order of magnitude of~~ the mass of a proton.

$$10^{-27} = \frac{1}{10^{27}}$$

$$\frac{1}{10^{27}} \cdot \frac{10^4}{1} = \frac{10^4}{10^{27}} = \frac{1}{10^{23}}$$

Homework:

pp 506-507

#s 28 - 45, 50, 51, 53