

Name _____ Period _____

Review 8.1-8.3

Algebra 1 Homework

Remember the Shortcuts:

$$x^a \cdot x^b = x^{a+b}$$

APPLY IT! ⇒

Simplify:

$$(G^3 H)(G^2 H^5) = G^5 H^6$$

$$(x^a)^b = x^{ab}$$

APPLY IT! ⇒

Simplify:

$$(G^4)^2 \cdot (G^3)^3 = G^{17}$$

$$(xy)^a = x^a y^a$$

APPLY IT! ⇒

Simplify:

$$(2m^2 n)^3 = 2^3 m^6 n^3 = 8m^6 n^3$$

$$x^0 = 1$$

APPLY IT! ⇒

Simplify:

$$\left(\frac{12p^3 q^5}{7pq^8}\right)^0 = 1$$

$$\left(\frac{x}{y}\right)^{-a} = \frac{y^a}{x^a}$$

APPLY IT! ⇒

Simplify:

$$(3x)^{-2} = \frac{1}{(3x)^2} = \frac{1}{9x^2}$$

$$\frac{1}{x^{-a}} = x^a$$

APPLY IT! ⇒

Simplify:

$$\frac{5w}{j^{-2} w^{-3}} = 5w j^2 w^3 = 5j^2 w^4$$

IF YOU SEE A NEGATIVE EXPONENT, FIRST STEP SHOULD BE...

CROSS THE LINE AND CHANGE THE SIGN!

Example: Simplify the following:

$$\frac{4^{-1} p^{-4} r^2}{2^{-3} p^{-2} r^{-3}} = \frac{2^3 p^2 r^2 r^3}{4^1 p^4} = \frac{8 p^2 r^5}{4 p^4} = \frac{2 r^5}{p^2}$$

$$\frac{2r^5}{p^2}$$

FIND THE MISTAKE!! There is an error in each of the 4 simplifying problems. Find it, explain it, and correct it. Write the correct simplified expression.

1) $(3x^2y^3)^2(7xy^2) = (3x^4y^6)(7xy^2) = \underline{21x^5y^8}$

Mistake: *didn't square the 3*

Correction: $(3^2x^4y^6)(7xy^2) = \boxed{63x^5y^8}$

2) $\left(\frac{4x^0y^{-2}}{4}\right)^2 = \left(\frac{x}{y^2}\right)^2 = \frac{x^2}{y^4}$

Mistake: *added exponents instead of mult.*

Correction: $(x^0y^{-2})^2 = x^0y^{-4} = \frac{1}{y^4}$

3) $(-3a^2bc^3)^3 = 27a^6b^3c^9$

Mistake: *forgot the negative*

Correction: $(-3)^3a^6b^3c^9 = -27a^6b^3c^9$

4) $\left(\frac{5v^{-2}}{w^2}\right) = \left(\frac{1}{5v^2w^2}\right)$

Mistake: *switched the 5 to the denom. when they didn't have to*

Correction: $\frac{5}{v^2w^2}$

Circle the following statements equivalent to $\frac{x^7}{2y^2}$ **A & D**

a) $\left(\frac{2x^{-3}y^2}{x^4y^0}\right)^{-1}$ b) $\left(\frac{x \cdot x^7}{2y^2}\right)$ ~~c) $\left(\frac{x}{2y}\right)(x^5)$~~ d) $\left(\frac{3x^0y}{6x^2y^3}\right)$

$\left(\frac{2y^2}{x^3x^4}\right)^{-1} = \left(\frac{x^7}{2y^2}\right)^1$ $\left(\frac{x^2}{4y^2}\right)\left(\frac{x^5}{1}\right) = \frac{x^7}{4y^2}$

Simplify the following:

1) $\left(\frac{w^2k^{-3}}{3w^3k}\right)^2 = \left(\frac{1}{3wk^4}\right)^2 = \boxed{\frac{1}{9w^2k^8}}$

2) $(2b^2c)^3 \cdot (4b^3c) = (8b^6c^3) \cdot (4b^3c) = \boxed{32b^9c^4}$

3) $h^2 \cdot h^0 \cdot h^{-4} = h^2 \cdot 1 \cdot \frac{1}{h^4} = \frac{h^2}{h^4} = \boxed{\frac{1}{h^2}}$

4) $\frac{(12x^3y^{-3})^{-2}}{(3x^{-2}y^4)^{-3}} = \frac{(3x^{-2}y^4)^3}{(12x^3y^{-3})^2} = \frac{27x^{-4}y^{12}}{144x^6y^{-6}} = \frac{27x^{-4}y^{12} \cdot y^6}{144x^6} = \frac{27x^{-4}y^{18}}{144x^6} = \frac{3x^{-4}y^{18}}{16x^6} = \frac{3y^{18}}{16x^{10}}$

3) $h^2 \cdot h^0 \cdot h^{-4}$

$$h^2 \cdot 1 \cdot \frac{1}{h^4} = \frac{h^2}{h^4} = \boxed{\frac{1}{h^2}}$$

4) $\frac{(12x^3y^{-3})^{-2}}{(3x^{-2}y^4)^{-3}}$

$$= \frac{(3x^{-2}y^4)^6}{(12x^3y^{-3})^2}$$
$$= \frac{3^3 x^{-6} y^{12}}{12^2 x^6 y^{-6}} = \frac{27y^{18}}{144x^{12}}$$

$$= \boxed{\frac{3y^{18}}{16x^{12}}}$$