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Webassign problems people had trouble with

Ex:

$$12y^3(4y^0)^3 = 12y^3(4(1))^3$$

$$= 12y^3(4^3)$$

$$= 12y^3(64)$$

$$= 768y^3$$

Ex: $18y^3(6y^0)^3 = 18y^3(6^3)$

$$= 18 \cdot 216 y^3$$

$$= 3888 y^3$$

III. Negative Integer Exponents

$$2^{-3} = ?$$

$$2^3 \cdot 2^{-3} = 2^{3+(-3)} = 2^0 = 1$$

$$\begin{array}{c} \downarrow \quad \downarrow \\ 8 \cdot \frac{1}{8} = 1 \end{array}$$



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

Any number to a negative power is the same as its reciprocal to the positive power.

$$2^{-3} = \left(\frac{1}{2}\right)^3 = \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} = \frac{1^3}{2^3} = \frac{1}{8}$$

Definition of reciprocal: The reciprocal of a number is the number it must be multiplied by to equal 1.

Example of reciprocals: $-\frac{2}{3} \cdot -\frac{3}{2} = 1$ $(-\frac{2}{3}, -\frac{3}{2})$

The only number
that does not have
a reciprocal is 0

$$2 \cdot \frac{1}{2} = 1 \quad (2, \frac{1}{2})$$

$$\frac{4}{3} \cdot \frac{3}{4} = 1 \quad (\frac{4}{3}, \frac{3}{4})$$

Since 0 times anything
is 0.

$$1 \cdot 1 = 1 \quad (1, 1)$$

You are free to move any factor to the other part of the fraction
If you change the sign of the exponent.

Ex: $2^{-3} = \frac{2^{-3}}{1} = \frac{1}{2^3}$

Important: We assign will never have a correct answer that has
a negative exponent in it.

Example: $\frac{5ab^{-3}}{2} = \frac{5a}{2b^3}$

For we assign even though
the left and right are equal
the left is considered wrong
and the right is correct.

III. 3rd property of Exponents:

$$\frac{x^5}{x^2} = \frac{x^{5-2}}{1} = x^3$$

↓

$$\frac{\cancel{x} \cdot \cancel{x} \cdot x \cdot x \cdot x}{\cancel{x} \cdot \cancel{x}} = x \cdot x \cdot x = x^3$$

$$\text{Ex: } \frac{5a^7b^3}{10a^5b^{10}} = \frac{1a^{7-5}b^{3-10}}{2} = \frac{a^2b^{-7}}{2} = \frac{a^2}{2b^7}$$

Example Webassign problems on Negative Exponents:

$$1) 4^{-1} + 5^{-1} = \frac{1}{4} \cancel{+} \frac{1}{5} = \frac{1 \cdot 5}{4 \cdot 5} + \frac{1 \cdot 4}{4 \cdot 5} = \frac{5}{20} + \frac{4}{20} = \frac{9}{20}$$

Handy/Pondy Method to combine fractions without a common denominator

1) Multiply your denominators

2) start with the upper left
and cross multiply

$$2) (4^{-1})^{-2} = 4^{-1 \cdot -2} = 4^2 = 16$$

$$3) \frac{49x^{16}}{28x^8} = \frac{7x^{16-8}}{4} = \frac{7x^8}{4}$$

$$4) \left(\frac{x}{9}\right)^{-1} = \frac{9}{x}$$

$$5) \left(\frac{x^{-2}y^3}{3}\right)^{-3} = \left(\frac{3}{x^{-2}y^3}\right)^3 = \left(\frac{3x^2}{y^3}\right)^3 = \frac{3x^2}{y^3} \cdot \frac{3x^2}{y^3} \cdot \frac{3x^2}{y^3} = \frac{27x^6}{y^9}$$