Exponents - A Crash Course

Shortcuts

Here are the basic rules for exponents:

When you are multiplying, if your base numbers or variables match, add the exponents.

Example:

$$x^{3} = x^{5} = x^{8}$$

Negative exponents mean that the base should be moved to the other part of the fraction and the exponent made positive.

Examples:

$$a^{-3} = \frac{1}{a^3}$$
 or $\frac{5}{b^{-2}} = 5b^2$

When you are dividing you can subtract the exponents as long as the bases are the same.

Example:

$$\frac{y^6}{y^2} = y^4$$

If you find an exponent attached to a product or quotient, every factor must receive that exponent. Think of it as the distributive property for exponents.

Example:

$$\left(\frac{3a^3}{4b^5}\right)^2 = \frac{3^2 \left(a^3\right)^2}{4^2 \left(b^5\right)^2} = \frac{9a^6}{16b^{10}}$$

Now give these a try:

1)
$$a^4 \circ a^7 = 0$$

$$a^{4+7}$$

2)
$$b^{3} \circ b^{-7} = \frac{1}{b^{4}}$$

$$b^{3+(-7)}b^{-4}$$

3)
$$\frac{c^4}{c} = (3)$$

4)
$$d^{-2} = \frac{1}{\sqrt{a}}$$

5)
$$\frac{f^5}{f^7} = \left(\frac{1}{f^2}\right)$$

$$f^5 = \frac{7}{5} - \frac{7}{2} - \frac{1}{2}$$

6)
$$3g^2 \cdot 7g = 2/g^3$$
 $3.7.9^{2+1}$

$$\frac{18h^{5}}{12h^{2}} = \frac{3h^{3}}{2}$$

8)
$$\frac{3j^2k^5}{12j^4k^3} = \frac{k^5}{4j^2}$$

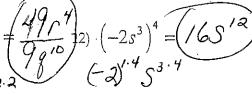
$$\frac{1}{4}j^{2-4}k^{5-3}$$

9)
$$(4m^2n^4)^3 = (4m^2n^4)^3 = p^4$$

$$4 \frac{(4m^2n^4)^3}{m^2n^4} = p^4$$

$$9) (4m^2n^4)^3 = (4m^2n^4)^3 = p^4$$

$$11) \left(\frac{3q^3}{7r^2} \right) = \frac{447r^7}{9q^{10}}$$



$$\begin{array}{c}
64 \\
13) \left(\frac{5t^3u}{2}\right)^3 = 1256 \\
5/3 & 3.3
\end{array}$$

$$\frac{(25 + \sqrt{3})}{8} - (6v^3)^{-3} = \frac{1}{216v}$$

9)15)
$$5w^3 \circ 3w^{-4} = \frac{15}{10}$$

5.3 $w^{3+(-4)}$

$$\frac{x^{3}yz^{4}}{xy^{4}z^{2}} = \left(\frac{x^{2}z^{2}}{y^{3}}\right)^{4}$$