

Lesson – Multiplying and Dividing Exponents

Name _____ Date _____ Period _____

In order to multiply numbers that have variables with exponents, you must multiply the c _____ separately and then multiply each v _____ separately. Whenever you multiply two variables together, you must add their e _____.

For instance, let's look at the following example:

$$6x^2 \cdot 3xy =$$

Because 6 and 3 are both c _____, we multiply them by each other. 6 times 3 gives us _____.

Because x^2 and x are both v _____ with the same base letter, we multiply them by each other. When we multiply variables, we a _____ their exponents. Thus, x^2 times x gives us _____.

Because y has no corresponding term, we leave it a _____.

Thus, our final answer is going to be the combination of all three of our answers from above.

$$6x^2 \cdot 3xy = \underline{\hspace{2cm}}$$

Try some more examples:

$$1) 4x^3 \cdot 2x =$$

$$2) 8xy^3 \cdot 4xy =$$

$$3) 9x \cdot 5xy =$$

$$4) 3x^3 \cdot 8x^2 =$$

$$5) 9a \cdot 2a^2b =$$

$$6) 7g^3 \cdot 3 =$$

Dividing exponents works very similarly to multiplying them. Again, we divide the c_____ and each v_____ separately. The difference is that when we divide variables, we divide their e_____.

Look at the following example.

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

Because 8 and 4 are both coefficients, we divide them by each other. 8 divided by 4 gives us _____.

Because x^3 and x^2 are both variables with the same base letter, we divide them by each other. To do this, we subtract the exponents. 3 minus 2 gives us _____ as the final exponent for x.

Because y^4 has nothing to divide by, we leave it alone, and we leave it on t_____. If it started out on the bottom, then we would leave it on the b_____.

Thus, our final answer should be the combination of our answers from above.

$$\frac{8x^3y^4}{4x^2} = \underline{\hspace{2cm}}$$

IMPORTANT: If the same variable with the same exponent appears on the top and the bottom, they simply c_____ each other out.

IMPORTANT: If the coefficient on top is smaller than the coefficient on the bottom, just reduce them as if it was a f_____. If you can't, just leave them a_____.

Try some more examples:

$$1) \frac{6x^5y^3}{3x^2y^2} =$$

$$2) \frac{24xy^5}{6y^3} =$$

$$3) \frac{4ab^5c}{16ab^3} =$$

$$4) \frac{15x^3yz}{5x^7z} =$$