ACELLUS - SPECIAL LESSON

"Should I Add or Multiply?"

DIRECTIONS

Exponents are interesting. Depending on their placement within an expression, they could be added or multiplied to other terms. As the Algebra expert, it's your job to determine whether you add or multiply when given a problem.

The number or variable to the left of the exponent is referred to as the base. With a^5, a is the base and the "5" is the exponent. When multiplying common bases, we ADD the exponents. For example, we notice that the expression b^2b^3 has common bases of b. Although it would be tempting to multiply the exponents, we must add them.

"Why," you ask? b^2 literally means $b * b$ and b^3 means $b * b * b$. Since we know there are now 5 b's, our answer becomes b^5. An easier way to solve this problem is to simply add the exponents.

So what happens if the exponent is placed outside a parenthesis?

In this case, we MULTIPLY the exponents. For example, we notice the expression $(f^2g^3)^4$. In this case, we will multiply the exponents together. You usually think of multiplication when parentheses are involved, so this should be natural for you.

"Why," you ask? $(f^2g^3)^4$ literally means $(f^2g^3)(f^2g^3)(f^2g^3)(f^2g^3)$ because there are four groups as indicated by the exponent of four. Instead of expanding the groups like this, we could just multiply to simplify the expression to f^8g^{12}.

EXAMPLE PROBLEM

Simplify the following expression

$4b^53b^2$	Step 1: We identify whether we add or multiply. In this case, there are no parenthesis, so we add.
$12b^5b^2$	Step 2: In this problem, we have two integers in "4" and "3," so we will multiply them as we would normally. They are not added because they're not exponents.
$12b^7$	Step 3: Now we add the exponents. Finished!

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Simplify the following 10 expressions by adding or multiplying exponents.

1.) $2x^2 8x$

2.) $7x^2 x^7$

Answer: _____

Answer: _____

3.) $(f^4 g^4)^4$

4.) $(2a^7 a^2)^3$

Answer: _____

Answer: _____

5.) $(-2x^7 y^2)^3$

6.) $(-4g^5 h^3)^2$

Answer: _____

Answer: _____

7.) $-7a^42a^7$

8.) $(-3g^5h^3)^3h^2$

Answer: _____

Answer: _____

9.) $(5r^5t^3)^2(rt)^2$

10.) $(4x^5y^3)^2(3x^6y)^2$

Answer: _____

Answer: _____