Lesson 2: Multiplication of Numbers in Exponential Form

Classwork

In general, if is any number and, are positive integers, then

because

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| Exercise 1 | Exercise 5  Let be a number. |
| Exercise 2 | Exercise 6  Let be a number. |
| Exercise 3 | Exercise 7  Let be a number. |
| Exercise 4 | Exercise 8  Let be a positive integer. If , what is ? |

What would happen if there were more terms with the same base? Write an equivalent expression for each problem.

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| Exercise 9 | Exercise 10 |

Can the following expressions be simplified? If so, write an equivalent expression. If not, explain why not.

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| Exercise 11 | Exercise 14 |
| Exercise 12 | Exercise 15 |
| Exercise 13 | Exercise 16 |

Exercise 17

Let be a number. Simplify the expression of the following number:

Exercise 18

Let and be numbers. Use the distributive law to simplify the expression of the following number:

Exercise 19

Let and be numbers. Use the distributive law to simplify the expression of the following number:

Exercise 20

Let and be numbers. Use the distributive law to simplify the expression of the following number:

In general, if is nonzero andare positive integers, then

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| Exercise 21 | Exercise 23 |
| Exercise 22 | Exercise 24 |

Exercise 25

Let *,*  be nonzero numbers. What is the following number?

Exercise 26

Let be a nonzero number. What is the following number?

Can the following expressions be simplified? If yes, write an equivalent expression for each problem. If not, explain why not.

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| Exercise 27 | Exercise 29 |
| Exercise 28 | Exercise 30 |

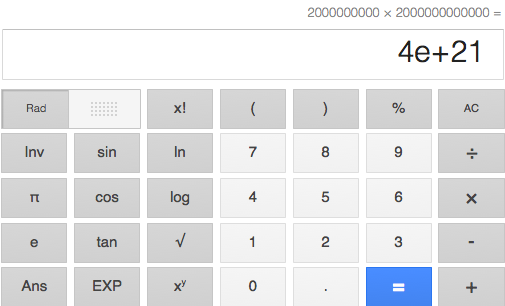
Exercise 31

Let be a number. Simplify the expression of each of the following numbers:



Exercise 32

Anne used an online calculator to multiply . The answer showed up on the calculator as , as shown below. Is the answer on the calculator correct? How do you know?

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Problem Set

1. A certain ball is dropped from a height of feet. It always bounces up to feet. Suppose the ball is dropped from feet and is caught exactly when it touches the ground after the th bounce. What is the total distance traveled by the ball? Express your answer in exponential notation.

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| Bounce | Computation of Distance Traveled in Previous Bounce | Total Distance Traveled (in feet) |
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1. If the same ball is dropped from feet and is caught exactly at the highest point after the th bounce, what is the total distance traveled by the ball? Use what you learned from the last problem.
2. Let and be numbers and , and let and be positive integers. Simplify each of the following expressions as much as possible:

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1. Let the dimensions of a rectangle be ft. by ft. Determine the area of the rectangle. No need to expand all the powers.
2. A rectangular area of land is being sold off in smaller pieces. The total area of the land is square miles. The pieces being sold are square miles in size. How many smaller pieces of land can be sold at the stated size? Compute the actual number of pieces.