**Practice New Skills: Scientific Notation and Multiplying Exponents**

1. Complete the table by converting between standard and scientific notation and the verbal description. An example is given in the first row.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Verbal Description** | **Standard Notation** | **Scientific Notation** |
| Example | 2.3 billion | 2,300,000,000 | 2.3 x 109 |
|  | 3 billion, 250 million |  |  |
|  |  | 62,000,000 |  |
|  |  |  | 5.6 x 108 |
|  | 5 trillion |  |  |

1. Identify the base that is being raised to the 5th power for each expression.

|  |  |  |  |
| --- | --- | --- | --- |
| Base: | Base: | Base: | Base: |

Simplify each expression.

|  |  |  |
| --- | --- | --- |
| 1. = | 1. = | 1. = |

Use the rule for multiplying bases to simplify the following problems in scientific notation. Remember to be sure your answer is in scientific notation.  **Show your work.**

1. (1.2 x 1010) (3.0 x 107)
2. (5.2 x 104) (6.0 x 108)

**Writing About Math**

Writing about math serves several purposes:

* Research shows that students learn and remember concepts better when they write about them.
* Writing or explaining a concept helps you to assess your own understanding.
* Writing about a process in a logical, clear and concise manner is an important skill and takes a great deal of practice. This type of writing is often called technical writing. The writing in this course will help you develop this skill and prepare you for the type of writing you will use in many future courses and situations in your future career and life.

Refer back to the Day 2 HW, Day 3 Activity. Review how the examples are explained. This is a 2-column form in which the mathematical work is shown in one column with explanations next to it. Also notice the following characteristics:

* The work is shown step-by-step.
* Each step is explained completely with both a description of *what* is done and *why*.
* The explanations use correct vocabulary like numerator, denominator, multiply, etc.
* The explanations do not use personal pronouns and pronouns such as *it, they* are limited.

Here are some more examples demonstrating common errors in technical writing.

**Use short, complete sentences.**

|  |  |
| --- | --- |
| **Too long and repetitive:**  When adding fractions, you have to have the same denominator for all the fractions you have because you can’t add them without it.  **Incomplete sentence:**  Need a common denominator. | **Better**  To add fractions, find a common denominator. |

**Use correct mathematical vocabulary.**

|  |  |
| --- | --- |
| **Incorrect vocabulary:**  If you times the top number and the bottom number by the same number, you get the same fraction. | **Better**  Multiplying the numerator and the denominator by the same number does not change the value of the fraction. The fractions are equivalent. |

**Use precise language. Avoid pronouns.**

|  |  |
| --- | --- |
| **Unclear what pronouns represent:**  4x and 8x are *like terms* because they are the same. It’s not *like terms* if they’re different like with a different power or letter. | **Better**  4x and 8x are *like terms* because the variables are the same and have the same power in both expressions. 4x and 8x2 are not *like terms* because the powers are different. 4x and 8y are not *like terms* because the variables are different. |

**Use specific examples to explain concepts. Put space between parts of the problem.**

|  |  |
| --- | --- |
| **Hard to understand:**  To find the reciprocal of a number, turn it over. If it’s a whole number use 1 in the bottom. If it’s mixed, you have to convert it first. | **Better**  The reciprocal of a number reverses the numerator and denominator. So the reciprocal of  is  .  To find the reciprocal of a whole number, write the whole number with a denominator of 1 first.  so the reciprocal of 5 is .  For mixed numbers, convert the number to an improper fraction first.  so the reciprocal is . |

**Writing Prompt #1**

1. Use the guidelines above to write an explanation and solution for the following problem. Vocabulary that you should use includes, but is not limited to: denominator, numerator, multiply. Think about writing the explanation for someone who has never learned to add fractions before.



You may write your work *neatly* or type your work on a separate piece of paper.