**Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Per: \_\_\_\_\_\_**

**U11 CW #1** *Exponents pt. 1 – Exponential and Expanded Notation*

Fill in the notes and then complete the table below.

|  |
| --- |
| The expression 35 is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.  The \_\_\_\_\_\_\_\_\_\_ is \_\_\_\_\_\_. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is \_\_\_\_\_\_. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are numbers that are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ together.  The exponent indicates the number of times the base is used as a \_\_\_\_\_\_\_\_\_\_\_\_\_\_. |

 When you see a little calculator picture, it is a reminder to use your calculator.

|  |  |  |
| --- | --- | --- |
| **Power** | **Factors** | **Value** |
| (-2)1 | -2 | -2 |
| (-2)2 | -2 x -2 | 4 |
| (-2)3 | -2 x -2 x -2 |  |
| (-2)4 |  |  |
| (-2)5 |  |  |
| (-2)6 |  |  |

 What do you think is meant by the expression (-2)n.

**Exponential Notation and Expanded Notation**

 46 means  means 

In the problem above, the 46 is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the 4•4•4•4•4•4 is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

In general, for any number **x** and any positive integer **n**, xn = 

 n times

**Directions:** Write each product using exponential notation.

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

**Directions:** Write each in expanded notation.

|  |  |  |
| --- | --- | --- |
| 1. $3^{7}$
 | 1. $9^{3}x^{4}$
 | 1. $6b^{3}cd^{2}$
 |
| 1. $(-2)^{3}$
 | 1. $\left(\frac{1}{3}\right)^{4}$
 | 1. $s^{12}$
 |
| 1. $\left(\frac{j}{k}\right)^{5}$
 | 1. $2^{3}•4^{5}$
 | 1. $-(x^{2}z^{3})$
 |

**Directions 1-4:** Write each term in expanded notation. Then evaluate (find the value of) each expression twice using your calculator and 1) typing the expression exactly as written and 2) the expanded form. Then, answer the Follow-Up Question.

|  |  |
| --- | --- |
| 1. (-3)4 | 2. -34 |
| **Follow-Up Question:** Are your answers the same?  |
| 3. (-2)5 | 4. -25 |
| **Follow-Up Question:** Are your answers the same? Why or why not? |

**Directions:** Write each term in expanded notation. Then evaluate each expression. Keep answers in fractions if not whole numbers.

|  |  |
| --- | --- |
| 5. 52 | 6. -93 |
| 7. (½)6  | 8.  |
| 9. Find, Fix, and Justify: Describe and correct the error in evaluating the expression. Write out  the correct way to solve the problem. |

**Extension:** Evaluate each expression. Then, answer the Follow-Up Question.

|  |  |
| --- | --- |
| 10. (-1)5 | 11. (-1)6 |
| 12. (-1)3 | 13. (-1)4 |
| 14. (-1)9 | 15. (-1)8 |
| **Follow-Up Question:** Can we determine whether the product of the above examples are positive or negative without doing any calculations? If so, explain how. Determine the sign of (-4)65. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Determine the sign of (-2.7)148. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Determine the sign of (8)201. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |