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

**U11 CW #2** *Exponents pt. 2 –Zero and Negative Exponents*

**Directions:** Determine the exponent that should go in each box to make the equations true.

|  |  |  |
| --- | --- | --- |
| 2 = 8 | 1.

42 = 2 | 1.

3 = 9 |

**Directions:** Determine where the parenthesis should go in each term to make the equations true.

|  |  |  |
| --- | --- | --- |
| 1.
* 2 4 = 16
 | 1.
* 2 4 = -16
 | 1.
* 3 6 = 729
 |

**Directions**: Write the expanded notation of each of the following terms. Then using your calculator determine the simplified numerical value.

|  |  |  |
| --- | --- | --- |
| **Quotient** | **Expanded Notation** | TI-30XIIS**Numerical Value** |
|  |  |  |
|  |  |  |
| $$\frac{x^{6}}{x^{6}}$$ |  |  |

|  |
| --- |
| **Exponent Rule:** In general, if x is any variable, number, or term and raised to the  power of zero (0) then the variable, number, or whole term  is equal to zero (0).**Checklist with a Base raised to the power of 0:** 1. Only the term that is raised to the power of \_\_\_\_\_\_\_ equals \_\_\_\_\_\_\_\_\_. 2. If there are any other variables or numbers, \_\_\_\_\_\_\_\_\_\_\_\_ by \_\_\_\_\_\_\_\_  and simplify the rest of the term.**Examples:** $x^{0}=1$ or $xy^{0}=x•1=x$ or $2^{0}=1$ |

Let’s Practice what we just learned: Complete each part of the table.

|  |  |  |
| --- | --- | --- |
| **Problem** | **Factors** | **Simplified Exponential Notation**  |
| 2x0 |  |  |
| -22a3b0c |  |  |
| (17)0x4y |  |  |
| (123x24)0 |  |  |

**Directions:** Evaluate the following. Show your work when possible.

|  |  |  |
| --- | --- | --- |
| a) 80 | b) (100000000)0 | c) (xyz)0 |
| d) (-4)0 | e) -40 | f) x0 |
| g) ab0 | h) 3k0 | i) 12a0 + 42 |
| j) 30 + 22 - 4 | k) 23x0 + 17y0 | l) $\left(\frac{3xy^{17}}{37z}\right)^{0}$ |

**Negative Exponents**

|  |  |  |
| --- | --- | --- |
| **Quotient** | **Factors** | **Simplified Quotient** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

|  |
| --- |
| **Exponent Rule:** **Negative Exponents**For any integer n and any nonzero number a, $n^{-a}=\frac{1}{n^{a}} or n^{a}=\frac{1}{n^{-a}}$ **Examples:**   or $5^{2}= \frac{1}{5^{-2}} x^{3}=\frac{1}{x^{-3}}$ |

**Directions:** Rewrite each of the following in positive exponential notation.

|  |  |  |
| --- | --- | --- |
| a)  | b)  6 | c)  |
| d)  | e)  | f) $\frac{x}{y^{-4}}$ |

 **Directions:** Evaluate each of the following expressions.

|  |  |  |
| --- | --- | --- |
| a)  3 | b)  | c)  |