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

**U11 CW #5** *Exponents pt. 5 – Raising an Exponent to a Power*

**Directions:** Complete the table below.

|  |  |  |
| --- | --- | --- |
| **Expression** | **Factors** | **Simplified Exponential Notation** |
|  |  |  |
|  |  |  |
|  |  |  |
| $$\left(x^{3}\right)^{2}$$ |  |  |
|  |  |  |

|  |
| --- |
| **Exponent Power Rule:** Raising a Power to a Power To raise a base a \_\_\_\_\_\_\_\_\_\_\_\_\_ to a \_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_ the \_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the exponents. **Example:** (45)3 = 415 |

**Quick Check:** What is the difference between the two problems below? Expand each term out and then evaluate the simplified exponential term.

32  35 (32)5

**Directions:** Simplify, use both expanded notation and exponential notation. Write your answer in positive exponential notation.

|  |  |
| --- | --- |
| a). ((-4)3)5 | b) (32)2 |
| c) ((-7)4)-2 | d) ((-4)-1)-3 |
| e) ((n)3)4 | f) ((2x)2)-2 |

**Directions:** Complete the table below.

|  |  |  |
| --- | --- | --- |
| **Expression** | **Factors** | **Simplified Exponential Notation** |
|  |  |  |
|  |  |  |
| $$(x^{2}•t)^{2}$$ |  |  |
| $$\left(\frac{x}{y}\right)^{2}$$ |  |  |
| $$\left(\frac{3}{w}\right)^{4}$$ |  |  |
| $$\left(\frac{a•b}{c}\right)^{2}$$ |  |  |
| $$\left(\frac{10•y^{3}}{2z^{2}}\right)^{3}$$ |  |  |

|  |
| --- |
| **Exponent Power Rule:** Power of a Product Property and Power of a Quotient PropertyWhen you raise a multiplication or division problem to a power, \_\_\_\_\_\_\_\_\_\_\_\_\_ the \_\_\_\_\_\_\_\_\_\_\_**\_\_** to **ALL** parts of the problem in the (parenthesis).**Examples:**   |

**Directions:** Simplify using expanded and exponential form. Final answer should be in positive exponential notation.

|  |  |  |
| --- | --- | --- |
| a)  | b)  | c)   |
| d)  | e)  | f)   |
| g) (2x)3  | h) (3x)4  | i) (ab)6  |
| j)  | k)  | l)  |

**Directions:** Simplify. Write your answer in positive exponential notation. Show your work!

|  |  |  |
| --- | --- | --- |
| 1.  | 2.  | 3.  |
| 4. $\left(\frac{12xy^{3}}{4xy}\right)^{0}$ | 5. $\frac{6ab^{-2}}{2a^{2}c}$ | 6. $\left(\frac{m^{-2}n^{0}}{4m^{2}o^{-1}}\right)^{3}$ |

7. What is the area of a square with a side length of $3a^{5}$? Hint: Draw a picture.