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| **EXPONENT RULES** |
| 1. **Multiplication Rule:**  **(am)(an) = am+n** e.g. (-x2)(2x3) = 2. **Power of a Product Rule:**  **(ab)m = am bm** e.g. (-3xy)3 = 3. **Power of a Power Rule:** **(am)n = am n**  e.g. (2x2y3) = 4. **Division Rule:** $\frac{(a^{m})}{(a^{n})}=a^{m-n}$ e.g. $\frac{x^{4}}{x^{2}}=$5. **Quotient Rule:** $(\frac{a}{b})^{m}=\frac{a^{m}}{b^{m}}$ e.g. $(\frac{x^{3}}{y^{4}})^{2}$= | 6. **Zero Exponent** A power with an exponent of zero is equal to . . . b0 = 1 e.g. 90 =  7. **Negative Exponent**When you are evaluating a power with a negative exponent, you . . .**Case 1. b-x =** $\frac{1}{b^{x}}$e.g. 3-1 e.g. 3-2**Case 2.** $(\frac{a}{b})^{-1}=(\frac{b}{a})^{1}=\frac{b}{a}$e.g. $(\frac{4}{3})^{-1}$=e.g.$(\frac{4}{3})^{-2}$= |

**Practice:**

1. $\left(3m^{2}n\right)(4mn^{3})$ 2. $\frac{24k^{5}q^{3}}{2k^{2}q}$ 3. $(2a^{3}b^{2})^{3}$

4. $\frac{\left(2x^{2}y^{3}\right)(3x^{3}y^{2})^{2}}{(4x^{5}y^{5})}$ 5. $(\frac{x^{4}y}{x^{2}y^{2}})^{3}$

**Task 1: Graphing the Exponential Relation**

For each equation:

a. Fill in the table of values.

b. Draw the graph and determine the key features of each graph as indicated below the grids.

c. Check your graphs using **DESMOS.**

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| ***x*** | ***y*** |
| -3 |  |
| -2 |  |
| -1 |  |
| 0 |  |
| 1 |  |
| 2 |  |
| 3 |  |

 |

|  |  |
| --- | --- |
| ***x*** | ***y*** |
| -3 |  |
| -2 |  |
| -1 |  |
| 0 |  |
| 1 |  |
| 2 |  |
| 3 |  |

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|  |  |
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| ***x*** | ***y*** |
| -3 |  |
| -2 |  |
| -1 |  |
| 0 |  |
| 1 |  |
| 2 |  |
| 3 |  |

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| y-intercept = \_\_\_\_\_\_\_\_\_\_x-intercept = \_\_\_\_\_\_\_\_\_\_vertex = \_\_\_\_\_\_\_\_\_\_axis of symmetry: \_\_\_\_\_\_\_\_\_\_ | y-intercept = \_\_\_\_\_\_\_\_\_\_x-intercept = \_\_\_\_\_\_\_\_\_\_increasing or decreasing? | y-intercept = \_\_\_\_\_\_\_\_\_\_x-intercept = \_\_\_\_\_\_\_\_\_\_increasing or decreasing? |

**Practice**

17. Match the power in the first row with the equivalent power in the second row, and the answer in the third row. Join them all with a line. The first one has been done for you.

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18. Walker states that. Paige states that. They are both correct. Explain why.

1. Please evaluate. DO NOT use decimals. Your answer should be an integer or a fraction.
	1.  b. 

c.  d.  e. 

f.  g.  h. 

i.  j.  k. 

1. Determine the value of the ‘?’.
	1.  b.  c. 

d.  e.  f. 

1. A power has a negative exponent. The answer is . What could the question have been? State THREE possibilities.