

Name: \_\_\_\_\_

Part 1:

| Exponent Properties: Negative Exponents  |   |                      |  |
|--|---|----------------------|--|
| Quotient   | Repeated multiplication   | Answer as a fraction | Use the quotient rule to get power of the form $a^c$ |
| $\frac{2^2}{2^5}$  | $\frac{2 \cdot 2}{2 \cdot 2 \cdot 2 \cdot 2 \cdot 2}$                                 | $\frac{1}{2^3}$      | $2^{2-5} = 2^{-3}$                                   |
| $\frac{a^4}{a^9}$  |   |                      |  |
|  |   | $\frac{1}{4^8}$      |  |
|  | $\frac{x \cdot x \cdot x \cdot y}{x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x}$ |                      |  |
| $\frac{a^4 b^5}{a^9 b^{12}}$   |   |                      |  |
| $\frac{g^3 h^6}{f g^5 h^7}$  |   |                      |  |
| <p>What does a negative exponent mean? Look at the two columns on the right and formulate a rule.</p>      |   |                      |  |
| <p>Does a negative exponent make the value of the problem negative?</p>                                    |   |                      |  |
| <p>What does <math>\frac{1}{2^{-3}}</math> simplify to be?</p>   |   |                      |  |
| <p>Write an explanation for the rule for negative exponents both in the numerator and the denominator:</p> |   |                      |  |

Part 2 (Negative Exponents):

1)  $x^{-4}$

2)  $r^{-3}$

3)  $\frac{1}{v^{-7}}$

4)  $\frac{1}{f^{-19}}$

5)  $\frac{j^{-5}}{k^{-8}}$

6)  $\frac{j^{-11}}{k^{-1}}$

7)  $\frac{a^3}{b^{-9}}$

8)  $\frac{w^{-2}}{x^7}$

9)  $\frac{4a^{-4}}{6b^2c^{-6}}$

Part 3 (Mixed Practice):

1)  $a \cdot a^2 \cdot a^3$

2)  $(2x^2y^7)(-8xy^4)$

3)  $\frac{x^{10}}{x^2}$

4)  $\frac{22a^2b^8}{2ab^2}$

5)  $8x^0$

6)  $\frac{15x^3y^5}{-9xb^7}$

7)  $(x^2)^9$

8)  $(-2x^4)^5$

9)  $(5x^5y^3z)^3$

10)  $\frac{2x^3}{-8x^4}$

11)  $\left(\frac{3x^3}{-9y^4}\right)^2$

12)  $(5y^{10})(9y^6)$