

Name: _____

Period: _____

Date: _____

Exponent Rules

Directions Simplify. Write your answer in exponential notation and with only positive exponents.

1. ~~$3a^5 \cdot 2a^7$~~

6. $\frac{64g^3}{8g} = \frac{64}{8} \cdot \frac{g^3}{g^1}$
 $= 8g^2$

2. $(-2x^4)(4x^{-2})$
 $= -2 \cdot 4 \cdot x^4 \cdot x^{-2}$
 $= -8x^{4+(-2)}$
 $= -8x^2$

7. ~~$(x^5)^2$~~

3. $7y^{10} \cdot 3y^6$
 $= 7 \cdot 3 \cdot y^{10} \cdot y^6$
 $= 21y^{16}$

8. $(3x^4)^5$
 $3^5(x^4)^5$

4. ~~$\frac{10t^4}{5t^2}$~~

9. $(5a^2b^3c^4)^7$
 $= 5^7(a^2)^7(b^3)^7(c^4)^7$
 $= 78,125a^{14}b^{21}c^{28}$

5. $\frac{12p^5}{4p^{-2}} = \frac{12}{4} \cdot \frac{p^5}{p^{-2}}$

$= 3p^{5-(-2)}$
 $= 3p^7$

11. $(4s)^0 = 1$

12. $x^3 \cdot x^{-3}$
 $x^3 \cdot \frac{1}{x^3} = \frac{x^3}{x^3} = 1$
 (Note: $x^{3+(-3)} = x^0 = 1$)

13. $y^{-2} = \frac{1}{y^2}$

14. $a^2 b^{-3} = \frac{a^2}{1} \cdot \frac{1}{b^3} = \frac{a^2}{b^3}$

Challenge Questions:

16. $\frac{(4a^2b^2)^3}{a^2b^3}$
 $= \frac{4^3(a^2)^3(b^2)^3}{a^2b^3}$
 $= \frac{64 a^6 b^6}{a^2 b^3}$
 $= 64 a^4 b^3$

17. $\frac{20x^4y^2z^3}{5x^2y^5z^6}$
 $= 4x^{4-2}y^{2-5}z^{3-6}$
 $= 4x^2y^{-3}z^{-3}$
 $= \frac{4x^2}{y^3 z^3}$
 (Note: $z^0 = 1$)

15. $\frac{4c^2}{2c^5}$
 $= \frac{2}{1} \cdot \frac{c^2}{c^5}$
 $= 2 \cdot c^{2-5}$
 $= 2 \cdot c^{-3}$
 $= \frac{2}{c^3}$
 (Note: $\frac{d \cdot c}{c \cdot c \cdot c \cdot c \cdot c}$)