Exponents

Rules for Exponents

Multiplying Exponents: $x^m \bullet x^n = x^{m+n}$

Dividing Exponents: $\dfrac{x^m}{x^n} = x^{m-n}$

Power Rule: $\left(x^m\right)^n = x^{m \bullet n}$

Zero Exponent Rule: $x^0 = 1$

Negative Exponent Rule: $x^{-m} = \dfrac{1}{x^m}, \quad \dfrac{1}{x^{-m}} = x^m, \quad \left(\dfrac{x}{y}\right)^{-m} = \left(\dfrac{y}{x}\right)^m$

Directions: Simplify and express your answer with positive exponents.

1. $x^{-9} \bullet x^{12}$

2. $4^2 \bullet 4$

3. $3x^{-8} \bullet 4x^{-7}$

4. $\dfrac{48x^{-12}}{60x^3}$

5. $\left(x^{-6}\right)^{-2}$

6. $\left(-4\right)^{-2}$

7. $\left(3x^{3}\right)^{0}$

8. -3^{-2}

9. $\left(6x^{3}\right)^{-3}$

10. $\left(3x^{10}y^{-4}\right)^{5}$

11. $\left(-x^7 y^8\right)^4$

12. $\left(\dfrac{2a^2b^3c^{-4}}{8a^4b^{-4}c}\right)^{-2}$

13. $\left(5y^2\right)\left(4y^{-3}z^4\right)^2$

14. $\left(\frac{x^{12}y^{3}}{y^{-2}z}\right)^{-4}$

15. $\left(\frac{x^{-2}}{y^{-2}}\right)\left(\frac{y}{x}\right)^{3}$