

Monomials and Rational Exponents Review Sheet

Name: _____

Simplify each expression. Write problems 4, 7, and 10 in scientific notation.

1.) $(-4x^2y^{-3})^{-3}$

8.) $(\frac{2k^3m^5}{k^{-3}m^{-2}})^{-3}$

2.) $\frac{(cd^5)^2}{5}(-3c^4d^{11})^3$

9.) $(-3x^4y^6)^2(2x^{-2}y^3)^3$

3.) $(\frac{3}{4}t^5p^3)^3$

10.) $\frac{7.2 \times 10^7}{9.7 \times 10^{-2}}(5.7 \times 10^{-3})$

4.) $\frac{3.27 \times 10^{-4}}{4.5 \times 10^{-8}}$

11.) $(27a^{30})^{\frac{1}{3}}$

5.) $\frac{(-2a^4d^3)^5}{(3a^{-2}d^7)^2}$

12.) $\frac{(-2a^5b^5d^{-2}g^3)^4}{(-3^{-2}a^{-2}b^4d^7g^3)^2}$

6.) $\frac{-3^2y^{-5}w^9}{3^{-3}y^4w^4}$

13.) $(64a^2b^6c^8)^{\frac{1}{2}}$

7.)

$(4.52 \times 10^3)(6.71 \times 10^{-6})(1.41 \times 10^{-5})$

14.) $(8a^3b^6c^{12})^{\frac{2}{3}}$

* Scroll down for full solutions.

Monomials and Rational Exponents Review Sheet

Name: Key

Simplify each expression. Write problems 4, 7, and 10 in scientific notation.

1.) $(-4x^2y^{-3})^{-3}$ $\frac{-y}{64x^6}$

8.) $(\frac{2k^3m^5}{k^{-3}m^{-2}})^{-3}$ $\frac{1}{8k^{18}m^{21}}$

2.) $\frac{(cd^5)^2}{5}(-3c^4d^{11})^3$
 $\frac{-27c^{14}d^{43}}{5}$

9.) $(-3x^4y^6)^2(2x^{-2}y^3)^3$
 $72x^2y^{21}$

3.) $(\frac{3}{4}t^5p^3)^3$
 $\frac{27t^{15}p^9}{64}$

10.) $\frac{7.2 \times 10^7}{9.7 \times 10^{-2}}(5.7 \times 10^{-3})$
 4.2309×10^6

4.) $\frac{3.27 \times 10^{-4}}{4.5 \times 10^{-8}}$
 7.26×10^3

11.) $(27a^{30})^{\frac{1}{3}}$
 $3a^{10}$

5.) $\frac{(-2a^4d^3)^5}{(3a^{-2}d^7)^2}$
 $\frac{-32a^{24}d}{9}$

12.) $\frac{(-2a^5b^5d^{-2}g^3)^4}{(-3^{-2}a^{-2}b^4d^7g^3)^2}$
 $\frac{1296a^{24}b^{12}g^6}{d^{22}}$

6.) $\frac{-3^2y^{-5}w^9}{3^{-3}y^4w^4}$ $\frac{-243w^5}{y^9}$

13.) $(64a^2b^6c^8)^{\frac{1}{2}}$
 $8abc^4$

7.) $(4.52 \times 10^3)(6.71 \times 10^{-6})(1.41 \times 10^{-5})$
 4.28×10^{-7}

14.) $(8a^3b^6c^{12})^{\frac{2}{3}}$ $4a^2b^4c^8$

$$\textcircled{1} (-4x^2y^{-3})^{-3} = \frac{1}{(-4x^2y^{-3})^3} = \frac{1}{(-4)^3(x^2)^3(y^{-3})^3}$$

$$= \frac{1}{-64x^6y^{-9}} = \boxed{\frac{-y^9}{64x^6}}$$

$$\textcircled{2} \frac{(cd^5)^2}{5} (-3c^4d^{11})^3 = \frac{c^2d^{10}}{5} (-3)^3 c^{12} d^{33}$$

$$= \frac{c^2d^{10}}{5} \times \frac{-27c^{12}d^{33}}{1} = \boxed{\frac{-27c^{14}d^{43}}{5}}$$

$$\textcircled{3} \left(\frac{3}{4}t^5p^3\right)^3 = \left(\frac{3}{4}\right)^3 t^{15} p^9 = \boxed{\frac{27t^{15}p^9}{64}}$$

$$\textcircled{4} \frac{3.27 \times 10^{-4}}{4.5 \times 10^{-8}} = \frac{3.27}{4.5} \times \frac{10^{-4}}{10^{-8}} = .72\bar{6} \times 10^4$$

$$= \boxed{7.2\bar{6} \times 10^3}$$

$$\textcircled{5} \frac{(-2a^4d^3)^5}{(3a^{-2}d^7)^2} = \frac{(-2)^5 a^{20} d^{15}}{3^2 a^{-4} d^{14}} = \frac{-32a^{20} a^4 d^{15}}{9d^{14}}$$

$$= \frac{-32a^{24}d}{9} = \boxed{\frac{-32a^{24}d}{9}}$$

$$\textcircled{6} \quad \frac{-3^2 y^{-5} w^9}{3^{-3} y^4 w^4} = \frac{-9 w^9 3^3}{y^5 y^4 w^4} = \boxed{\frac{-243 w^5}{y^9}}$$

$$\textcircled{7} \quad (4.52 \times 10^3)(6.71 \times 10^{-6})(1.41 \times 10^{-5}) = \\ (4.52 \times 6.71 \times 1.41) \times (10^3 \cdot 10^{-6} \cdot 10^{-5}) = \\ 42.764172 \times 10^{-8} = \\ \boxed{4.28 \times 10^{-7}}$$

$$\textcircled{8} \quad \left(\frac{2k^3 m^5}{k^{-3} m^{-2}} \right)^{-3} = \left(\frac{k^{-3} m^{-2}}{2k^3 m^5} \right)^3 = \left(\frac{1}{2k^6 m^7} \right)^3 \\ = \frac{1}{2^3 k^{18} m^{21}} = \boxed{\frac{1}{8k^{18} m^{21}}}$$

$$\textcircled{9} \quad (-3x^4 y^6)^2 (2x^{-2} y^3)^3 = (-3)^2 x^8 y^{12} (2)^3 x^{-6} y^9 \\ = 9 \cdot 8 x^2 y^{21} = \boxed{72 x^2 y^{21}}$$

$$\textcircled{10} \quad \frac{7.2 \times 10^7}{9.7 \times 10^{-2}} \times (5.7 \times 10^{-3}) = \frac{7.2 \times 5.7 \times 10^7 \times 10^{-3}}{9.7 \times 10^{-2}} \\ = \frac{41.04 \times 10^4}{9.7 \times 10^{-2}} = \boxed{4.2309 \times 10^6}$$

$$\textcircled{11} (27a^{30})^{1/3} = 27^{1/3} a^{30 \cdot \frac{1}{3}} = \boxed{3a^{10}}$$

$$\textcircled{12} \frac{(-2a^5b^5d^{-2}g^3)^4}{(-3^{-2}a^{-2}b^4d^7g^3)^2} = \frac{(-2)^4 a^{20} b^{20} d^{-8} g^{12}}{(-3)^{-4} a^{-4} b^8 d^{14} g^6}$$

$$= \frac{16 \cdot (-3)^{+4} a^{20} \cdot a^4 \cdot b^{20} g^{12}}{b^8 d^8 d^{14} g^6} = \boxed{\frac{1296a^{24}b^{12}g^6}{d^{22}}}$$

$$\textcircled{13} (64a^2b^6c^8)^{1/2} = (64)^{1/2} a b^3 c^4 = \boxed{8abc^4}$$

$$\textcircled{14} (8a^3b^6c^{12})^{2/3} = 8^{2/3} (a^3)^{2/3} (b^6)^{2/3} (c^{12})^{2/3}$$

$$= \sqrt[3]{8^2 a^2 b^4 c^8}$$

$$= \boxed{4a^2b^4c^8}$$