

Unit 7 Study Guide

Simplify. Write each answer in scientific notation.

1) $\frac{9.61 \times 10^4}{2 \times 10^{-4}}$ $4 + 4 = 8$

$$4.805 \times 10^8$$

2) $\frac{7.1 \times 10^1}{4.3 \times 10^4}$ $1 - 4 = -3$

$$1.65 \times 10^{-3}$$

3) $\frac{9.1 \times 10^2}{3.16 \times 10^1}$ $2 - 1 = 1$

$$2.88 \times 10^1$$

4) $(1.65 \times 10^{-6})(5.6 \times 10^{-1})$ $-6 + -1 = -7$

$$9.24 \times 10^{-7}$$

5) $(1.6 \times 10^{-4})(3 \times 10^{-2})$ $-4 + -2 = -6$

$$4.8 \times 10^{-6}$$

6) $(2.6 \times 10^1)(2.6 \times 10^6)$ $1 + 6 = 7$

$$6.76 \times 10^7$$

Simplify. Your answer should contain only positive exponents.

7) $3^4 \cdot 3^3$

$$3^4 = 3 \cdot 3 \cdot 3 \cdot 3 = \boxed{81}$$

8) $\frac{2^{-1}}{2} = \boxed{\frac{1}{2}}$

9) $(-3)^3$

$$-3 \cdot -3 \cdot -3 = \boxed{-27}$$

10) $\frac{3^1}{3^3} = \frac{1}{3^2} = \boxed{\frac{1}{9}}$

11) $\frac{2^2 \cdot (2^2)^2}{2^2} = \frac{2^2 \cdot 2^4}{2^2} = 2^4 = \boxed{16}$

12) $\frac{2 \cdot 2^{-1} \cdot 2^8}{(2^{-4})^2} = \frac{2 \cdot 2^{-1} \cdot 2^8}{2^{-8}} = \frac{2 \cdot 2^8}{4} = 2^8 = \boxed{256}$

$$13) \underbrace{-2n^1 \cdot 3n^{-3} \cdot -4n^{-2}}$$

$$\frac{24n^{-4}}{1}$$

$$\boxed{\frac{24}{n^4}}$$

$$14) \underbrace{2n^3 \cdot n^{-4}}$$

$$\frac{2n^{-1}}{1}$$

$$\boxed{\frac{2}{n}}$$

$$15) \underbrace{(2m^{-3}n^2)^3} \cdot 2n$$

$$\frac{2^3 m^{-9} n^6 \cdot 2n}{1}$$

$$\frac{8n^7 \cdot 2n^1}{m^9} = \boxed{\frac{16n^8}{m^9}}$$

$$16) \underbrace{(-2x^{-1}y^2)^{-2}} \cdot -2x^4y^{-1}$$

$$(-2)^{-2} x^2 y^{-4} \cdot -2x^4 y^{-1}$$

$$\frac{(-2)^{-2} x^6 y^{-5} \cdot -2}{1} = \frac{(-2)x^6}{(-2)^2 y^5} = \boxed{\frac{x^6}{-2y^5}}$$

$$17) -2y \cdot (2y^{-1})^0$$

$$\boxed{-2y}$$

$$18) v^{-4} \cdot (-u)^4$$

$$\frac{v^{-4} \cdot (-1)^4 u^4}{1}$$

$$\boxed{\frac{+1u^4}{v^4}}$$

$$19) \frac{(y^4)^3}{(x^4y^{-3})^2 \cdot -x^2y^{-1}}$$

$$\frac{y^{12}}{x^8 y^{-6} \cdot -1x^2 y^{-1}} \rightarrow \frac{y^{12} \cdot y^6 \cdot y^1}{-1x^8 x^2}$$

$$\boxed{-\frac{y^{19}}{x^{10}}}$$

$$20) \frac{xy^{-2}}{(2x^{-4})^2 \cdot -x^4y^3}$$

$$\frac{xy^{-2}}{2^2 x^{-8} \cdot -1x^4 y^3}$$

$$\frac{x \cdot x^8}{-4x^4 y^3 y^2} = \frac{x^9}{-4x^4 y^5} = \boxed{\frac{x^5}{-4y^5}}$$

$$21) \left(\frac{p^{-4}q^{-2}r^{-1} \cdot 2p^1}{-2rp^0q^2} \right)^2$$

$$\left(\frac{p^{-3}q^{-2}r^{-1} \cdot 2}{-2rq^2} \right)^2$$

$$\left(\frac{1}{-1rq^2 p^3 r^1} \right)^2$$

$$\left(\frac{-1r^2 q^4 p^3}{1} \right)^2$$

$$\frac{1}{(-1)^2 r^4 q^8 p^6}$$

$$\boxed{\frac{1}{r^4 q^8 p^6}}$$

$$22) \frac{(2p^{-1}q^0)^5}{-2p^4r^4 \cdot -2p^2q^{-4}r^3}$$

$$\frac{1q^4}{4p^6 r^7}$$