

Lesson 4.6/Chapter 4 Review Worksheet

Simplify. Your answer should contain only positive exponents.

1) $6^{-10} \cdot 6^0 = \boxed{\frac{1}{6^{10}}}$

2) $(-2)^{-8} \cdot (-2)^{-10} = (-2)^{-18} = \boxed{\frac{1}{(-2)^{18}}}$

3) $-5 \cdot (-5)^5 = \boxed{(-5)^6}$

4) $10^6 \cdot 10^{-6} = 10^0 = \boxed{1}$

5) $((-3)^2)^4 = \boxed{(-3)^8}$

6) $(2^{-2})^{-2} = \boxed{2^4}$

7) $((-3)^{-2})^4 = (-3)^{-8} = \boxed{\frac{1}{(-3)^8}}$

8) $(3^3)^{-4} = 3^{-12} = \boxed{\frac{1}{3^{12}}}$

9) $\frac{5^{-8}}{5^0} = 5^{-8} = \boxed{\frac{1}{5^8}}$

10) $\frac{3^4}{3^8} = 3^{-4} = \boxed{\frac{1}{3^4}}$

11) $\frac{5^{-4}}{5^5} = 5^{-9} = \boxed{\frac{1}{5^9}}$

12) $\frac{2^8}{2^2} = \boxed{2^6}$

13) $\left(\frac{2^2}{2^2 \cdot 2^{-1}}\right)^{-3} = \left(\frac{2^2}{2^1}\right)^{-3} = (2)^{-3} = \boxed{\frac{1}{2^3}}$

14) $\left(\frac{2}{2^{-4} \cdot 2^3}\right)^2 = \left(\frac{2}{2^{-1}}\right)^2 = (2^2)^2 = \boxed{2^4}$

15) $\left(\frac{(-2)^{-1}}{(-2)^3 \cdot (-2)^4}\right)^3 = \left(\frac{(-2)^{-1}}{(-2)^7}\right)^3 = \left((-2)^{-8}\right)^3 = (-2)^{-24} = \boxed{\frac{1}{(-2)^{24}}}$

16) $\frac{2^0 \cdot 2^{-1}}{2^3} = \frac{2^{-1}}{2^3} = 2^{-4} = \boxed{\frac{1}{2^4}}$

17) $\left(\frac{(-2)^4}{-2 \cdot (-2)^0 \cdot (-2)^{-3}}\right)^{-4} = \left(\frac{(-2)^4}{(-2)^{-2}}\right)^{-4} = \left((-2)^6\right)^{-4} = (-2)^{-24} = \boxed{\frac{1}{(-2)^{24}}}$

18) $\frac{(2^2)^{-4}}{2 \cdot 2^0} = \frac{2^{-8}}{2} = 2^{-9} = \boxed{\frac{1}{2^9}}$

$$19) \frac{(2^{-4})^2}{2^4 \cdot 2^3} = \frac{2^{-8}}{2^7} = 2^{-15} = \boxed{\frac{1}{2^{15}}}$$

$$20) -4x^2 \cdot -4x^2 = \boxed{16x^4}$$

$$21) -2a^{-2}b^{-1} \cdot a^{-2}b^3 = -2a^{-4}b^2 = \boxed{\frac{-2b^2}{a^4}}$$

$$22) 3m^{-3}n^4 \cdot -4m^{-2}n^2 = -12m^{-5}n^6 = \boxed{\frac{-12n^6}{m^5}}$$

$$23) (n^2)^4 = \boxed{n^8}$$

$$24) (3x^{-3})^{-3} = 3^{-3}x^9 = \boxed{\frac{x^9}{27}}$$

$$25) (2jk^0)^3 = 2^3j^3k^0 = \boxed{8j^3}$$

$$26) \frac{2n^4}{n^0} = \boxed{2n^4}$$

$$27) \frac{+2b^{-2}}{+4a^0b^{-3}} = \frac{b^1}{2} = \boxed{\frac{b}{2}}$$

$$28) \frac{+3y^4z^2}{+xz} = \boxed{\frac{3y^4z}{x}}$$

$$29) \frac{(2x^2)^2}{x \cdot -2x^{-2}} = \frac{4x^4}{-2x^{-1}} = \boxed{-2x^5}$$

$$30) -\frac{a^{-1}}{(-2a^4 \cdot 2a^0 \cdot -2a^4)^2} = -\frac{a^{-1}}{(8a^8)^2} = -\frac{1}{8^2 a^{16} a^1} = \boxed{-\frac{1}{64a^{17}}} = \frac{-1}{64a^{17}}$$

$$31) \frac{mn^3 \cdot 2m^{-2}n^0}{(2m^4n^2)^{-3}} = \frac{2m^{-1}n^3}{2^{-3}m^{-12}n^{-6}} = 2 \cdot 2^3 m^{11} n^9 = \boxed{16m^{11}n^9}$$

$$32) \frac{(-2x^2y^3 \cdot 2x^4y^4)^4}{2x^4y^{-1}} = \frac{(-4x^6y^7)^4}{2x^4y^{-1}} = \frac{(-4)^4 x^{24} y^{28}}{2x^4y^{-1}} = \frac{256x^{20}y^{29}}{2} = \boxed{128x^{20}y^{29}}$$

$$33) \frac{(h^{-1}j^3k^{-4})^2}{h^4j^2 \cdot jk^{-1} \cdot -h^0j^3k^{-1}} = \frac{h^{-2}j^6k^{-8}}{-h^4j^6k^{-2}} = -h^{-6}j^0k^{-6} = \boxed{\frac{-1}{h^6k^6}}$$

$$34) \frac{(-p^{-1}q^2r^0)^4}{-2p^0q^2r^2 \cdot qp^3r^{-3} \cdot -p^4q^2r^{-2}} = \frac{p^{-4}q^8r^0}{2p^7q^5r^{-3}} = \frac{p^{-11}q^8r^3}{2} = \boxed{\frac{q^8r^3}{2p^{11}}}$$

* negative base w even exponent = positive
negative base w odd exponent = negative