

Lesson 13.1-13.5 Review

Simplify each expression. Your answer should contain only positive exponents.

1. $6^3 \cdot 6^{10}$ $\boxed{6^{13}}$

2. $(-5mn^3)^2$ $\boxed{(-5)^2 m^2 n^6}$

3. $\frac{-18m^5 \cdot m^2 n^4}{-6m^9 n} = \frac{-18m^7 n^4}{-6m^9 n} = \boxed{\frac{3n^3}{m^2}}$

4. $\frac{(3hjk^{-2} \cdot h^4 j^{-1} k^4)^0}{2h^{-3} j^{-4} k^{-2}} = \frac{1}{2h^{-3} j^{-4} k^{-2}} = \boxed{\frac{h^3 \cdot 4k^2}{2}}$

5. 13^{-6} $\boxed{\frac{1}{13^6}}$

6. $\frac{24y^9}{6y^4} = \frac{4y^5}{1} = \boxed{4y^5}$

7. $\frac{-32x^8 y^5}{4x^6 y} = \frac{-8x^2 y^4}{1} = \boxed{-8x^2 y^4}$

8. $x^4 y^{-4} \cdot 2x^3 = 2x^7 y^{-4} = \boxed{\frac{2x^7}{y^4}}$

9. $-\frac{y^3}{y^5}$ $\boxed{-\frac{1}{y^2}}$

10. $\left(\frac{x^2 y^{-5} \cdot xy}{x^4 y^3}\right)^2 = \left(\frac{x^3 y^{-4}}{x^4 y^3}\right)^2 = \left(\frac{1}{xy^7}\right)^2 = \boxed{\frac{1}{x^2 y^{14}}}$

11. $\frac{2y^3 \cdot 3xy^3}{3x^2 y^4} = \frac{6xy^6}{3x^2 y^4} = \boxed{\frac{2y^2}{x}}$

12. 2^{-7} $\boxed{\frac{1}{2^7}}$

13. $\frac{(2x^{-1}y)^{-3}}{x^3 y^{-4}} = \frac{2^{-3} x^3 y^3}{x^3 y^{-4}} = \boxed{\frac{y^7}{2^3 x^0}}$

14. $\frac{15a^5 b^4}{3a^2 b^4} = \boxed{5a^3}$

15. $\frac{1}{6^{-8}}$ $\boxed{6^8}$

16. $x^8 \cdot x^7 \cdot x = \boxed{x^{16}}$

Write each number in either scientific notation or standard notation.

17. The diameter of Mercury is 4,879 kilometers.

$$4.879 \times 10^3$$

18. The distance from Saturn to the Sun at its closest point is about $8.4044 \cdot 10^8$ miles.

8 4044 0000

84,440,000 miles

19. The diameter of a platelet is about $3 \cdot 10^{-6}$ meters.

0.0000030

0.000003 meters

Simplify each using the properties of powers and write the answer in scientific notation.

20. $(1.4 \cdot 10^4)(4.6 \cdot 10^2)$

$$\begin{array}{r} 24.6 \\ \times 1.4 \\ \hline 184 \\ +460 \\ \hline 6.44 \end{array}$$

$6.44 \cdot 10^6$

21. $\frac{4.8 \cdot 10^2}{2 \cdot 10^4}$

$$2 \overline{)4.8}$$

2.4×10^{-2}

22. $\frac{6.25 \cdot 10^{-10}}{0.25 \cdot 10^4}$

$$0.25 \overline{)6.25} \begin{array}{r} 25. \\ -50 \\ \hline 125 \end{array}$$

25×10^{-14}

2.5×10^{-13}

23. $(5.2 \cdot 10^6)(5 \cdot 10^4)$

$$\begin{array}{r} 1 \\ 5.2 \\ \times 5 \\ \hline 26.0 \end{array}$$

26×10^{10}

2.6×10^{11}

24. $(1.5 \cdot 10^{-12})(6.5 \cdot 10^{-3})$

$$\begin{array}{r} 2 \\ 6.5 \\ \times 1.5 \\ \hline 325 \\ +650 \\ \hline 9.75 \end{array}$$

9.75×10^{-15}

25. $\frac{5.4 \cdot 10^{12}}{0.9 \cdot 10^5}$

$$0.9 \overline{)5.4}$$

6×10^7

6.0×10^7