Chapter 7 Major Quiz Review   Lessons 7-1 through 7-5

Simplify each expression

1. $5^{-2}(3^{-3})$

$\frac{1}{5^2} \cdot \frac{1}{3^3}$

$\frac{1}{25} \cdot \frac{1}{27} = \frac{1}{675}$

2. $(x^{-8})^{-4}$

$x^{-8 \cdot -4} =$

x^{32}

3. $(4x^6)(9x^{12})$

$(4 \cdot 9)(x^6 \cdot x^{12})$

multiply coefficients → $36x^{6+12} = 36x^{18}$ ← add exponents

4. $(x^2y^{-5})(xy)^4$

$x^2 \cdot y^{-5} \cdot x^4 y^4$

$(x^2 \cdot x^4)(y^{-5} \cdot y^4)$

$x^6 \cdot y^{-1} \Rightarrow \frac{x^6}{y}$

5. $a^6b^3(a^{-8})(c^0)$

$\frac{a^6 b^3 \cdot 1}{a^8} = \frac{b^3}{a^{8-6}} = \frac{b^3}{a^2}$

6. $(3^2)^{-2}(7x^4)^2$

$\frac{1}{(3^2)^2} \cdot 7^2(x^4)^2 = \frac{49x^8}{81}$

7. $(7x^4)(5x^7)$

$(7 \cdot 5)(x^4 \cdot x^7)$

$35x^{4+7} = 35x^{11}$

8. $(6x^0)^4(5x^3)^{-2}$

$6^4(x^0)^4 \cdot \frac{1}{5^2(x^3)^2}$

$\frac{1296 \cdot 1}{25x^6} = \frac{1296}{25x^6}$

9. $(cd^4)(c^{-3}b^0)$

$\frac{c \, d^4 \cdot 1}{c^3} = \frac{d^4}{c^{3-1}} = \frac{d^4}{c^2}$

10. The average distance from Venus to the sun is approximately 108,200,000 km. The average distance from Jupiter to the sun is approximately 483,800,000 km.
A   Write each number in scientific notation.

108,200,000 = $\underline{1.082 \times 10^8}$ 483,800,000 = $\underline{4.838 \times 10^8}$

B.   Find the distance between the orbits of Venus and Jupiter.

$4.838 \times 10^8 - 1.082 \times 10^8 = 3.756 \times 10^8$

11.   Vocabulary Identify the base, exponent, and power in the expression e^a.

Base : $\underline{e}$ Exponent: $\underline{a}$ Power: e^a

Simplify each expression.

12. $\left(\frac{6^4}{6^2}\right)^3 = (6^{4-2})^3$

$= (6^2)^3 = 6^{2 \cdot 3}$

$= 6^6 = 46,656$

13. $\left(\frac{c^6}{c^4}\right)^{-5} = (c^{6-4})^{-5} = (c^2)^{-5} = \frac{1}{(c^2)^5} = \frac{1}{c^{10}}$

$\left(\frac{2d^6}{c^4}\right)^{-5} = \frac{2^{-5}d^{-30}}{c^{-20}} = \frac{c^{20}}{2^5 d^{30}} = \frac{c^{20}}{32d^{30}}$

attitude adjustment

14. $\left(\frac{24m^{-3}}{36n^{-6}}\right)^2 = \left(\frac{2n^6}{3m^3}\right)^2$

Simplify First   attitude adjustment

$= \frac{2^2(n^6)^2}{3^2(m^3)^2} = \frac{4n^{12}}{9m^6}$

15. $\left(\frac{4^2 b^{-6}}{4^3 a^0 b^3}\right)^4 = \left[\frac{1}{4^{3-2} \cdot 1 \cdot b^6 \cdot b^3}\right]^4$

$= \left[\frac{1}{4 \cdot 1 \cdot b^9}\right]^4 = \frac{1}{4^4 \cdot (b^9)^4} = \frac{1}{256b^{36}}$