

Chapter 10 Review

Write the product using exponents.

$$1) \frac{1}{5} \cdot \frac{1}{5} \cdot \frac{1}{5} \cdot \frac{1}{5} \cdot \frac{1}{5} = \left(\frac{1}{5}\right)^5$$

$$2) (-2) \cdot (-2) \cdot (-2) = (-2)^3$$

$$3) y \cdot y \cdot y \cdot y \cdot y \cdot y = y^6$$

$$4) 4 \cdot 4 \cdot 4 \cdot c \cdot c = 4^3 c^2$$

Evaluate the expression.

$$5) -2^4 = \boxed{-16}$$

$$6) (-3)^3 = \boxed{-27}$$

$$7) (-2)^4 = \boxed{16}$$

$$8) \left(\frac{2}{5}\right)^2 = \boxed{\frac{4}{25}}$$

$$9) -\left(\frac{1}{4}\right)^3 = \boxed{-\frac{1}{64}}$$

$$10) 9^2 - 4^3 = 81 - 64 = \boxed{17}$$

Complete the following:

11) When you multiply powers with the same base, you add the exponents.

12) When you have exponents inside and outside the parenthesis, you multiply the exponents.

13) When you divide powers with the same base, you subtract the exponents.

14) Evaluate: $542,897^0 = \boxed{1}$

Simplify the expression. Write your answer as a power with only positive exponents.

$$15) \frac{3^4}{3^5} = \boxed{\frac{1}{3}}$$

$$16) \frac{3^5}{3^2} = \frac{3^3}{1} = \boxed{3^3}$$

$$17) (-1)^3 \cdot (-1)^2 = \boxed{(-1)^5}$$

$$18) \frac{(-2)^{10}}{(-2)^5} = \frac{(-2)^5}{1} = \boxed{(-2)^5}$$

$$19) \frac{2^5}{2^4} = \frac{2}{1} = \boxed{2}$$

$$20) \frac{5^4 \cdot 5^9}{5^6} = \frac{5^{13}}{5^6} = \frac{5^7}{1} = \boxed{5^7}$$

$$21) 3^{-4} = \boxed{\frac{1}{3^4}}$$

$$22) 5^{-12} \cdot 5^{12} = 5^0 = \boxed{1}$$

$$23) \frac{8^3}{8^5} = \boxed{\frac{1}{8^2}}$$

$$24) \frac{1}{4^{-5}} \cdot \frac{1}{4^8} = \frac{4^5}{4^8} = \boxed{\frac{1}{4^3}}$$

$$25) \frac{2^6}{2^{-8} \cdot 2^{10}} = \frac{2^6}{2^2} = \frac{2^4}{1} = \boxed{2^4}$$

$$26) \frac{1^2}{3^4} \cdot \frac{3^6}{1} = \frac{3^6}{3^4} = \frac{3^2}{1} = \boxed{3^2}$$

Simplify the expression.

$$27) (b^4)^2 = \boxed{b^8}$$

$$28) (4f)^3 = 4^3 f^3 = \boxed{64f^3}$$

$$29) \left(-\frac{3}{8}t^2\right)^2 = \boxed{\frac{9}{64}t^4}$$

$$30) \left(\frac{3}{4}w\right)^2 = \boxed{\frac{9}{16}w^2}$$

$$32) \frac{b^6}{(2b)^3} = \frac{b^6}{2^3 b^3} = \boxed{\frac{b^3}{8}}$$

$$33) \frac{x^{14}}{x^4 \cdot x^2} = \frac{x^{14}}{x^6} = \frac{x^8}{1} = \boxed{x^8}$$

$$34) \frac{5^7 a}{5^4 a^2} = \frac{5^3}{a} = \boxed{\frac{125}{a}}$$

$$35) \frac{q^2 \cdot q^5}{q^7} = \frac{q^7}{q^7} = \boxed{1}$$

$$36) \frac{y^3}{y^{11}} \cdot \frac{y^{21}}{y^9} = \frac{y^{24}}{y^{20}} = \boxed{y^4}$$

$$37) 6^{-1} \cdot 6^{-2} = 6^{-3} = \frac{1}{6^3} = \boxed{\frac{1}{216}}$$

$$38) (3x)^4 = 3^4 x^4 = \boxed{81x^4}$$

$$39) z^2(z \cdot z^3) = z^2(z^4) = \boxed{z^6}$$

Simplify the expression. Write your answer as a power with only positive exponents.

$$40) 8w^{-5} = \boxed{\frac{8}{w^5}}$$

$$41) \frac{2z^{-3}}{4z^{-5}} = \frac{1 \cdot z^5}{2 \cdot 2^3} = \boxed{\frac{z^2}{2}}$$

$$42) 9x^{-3} = \boxed{\frac{9}{x^3}}$$

$$43) 12x^{-7} \cdot 5x^{-4} = 60x^{-11} = \boxed{\frac{60}{x^{11}}}$$

$$44) 5^{-3} \cdot m^6 = \frac{m^6}{5^3} = \boxed{\frac{m^6}{125}}$$

$$45) \frac{7p^5}{p^{-1}} = \frac{7p^6}{1} = \boxed{7p^6}$$

$$46) \frac{10t^{-5}}{t^{-2}} = \frac{10t^2}{t^3} = \boxed{\frac{10}{t}}$$

$$47) \frac{15d^4}{3d^9} = \boxed{\frac{5}{d^5}}$$

$$48) 6w^{-2} \cdot 4w^2 = \boxed{24}$$

$$49) 4c^{-5}c^2 = \frac{4c^2}{c^5} = \boxed{\frac{4}{c^3}}$$

$$50) \frac{3x^2}{9x^5} = \boxed{\frac{1}{3x^3}}$$

$$51) \frac{(ab)^3}{a^2} = \frac{a^3 b^3}{a^2} = \boxed{ab^3}$$

Tell whether the number is written in scientific notation. **Explain.** If not, please change it; so, that it is so.

52) 0.3×10^4

No. The factor is not between 1 and 10.

$$\boxed{3 \times 10^3}$$

53) 12×10^{-7}

No the factor is not between 1 and 10

$$\boxed{1.2 \times 10^{-6}}$$

Write the number in standard form.

54) -2.7×10^{-2}

$$\boxed{-0.027}$$

55) 4×10^6

$$\boxed{4,000,000}$$

56) 5.999×10^5

$$\boxed{5,999,000}$$

57) 7.05×10^{-6}

$$\boxed{0.00000705}$$

Write the number in scientific notation.

58) 0.0031

$$\boxed{3.1 \times 10^{-3}}$$

59) 741,000

$$\boxed{7.41 \times 10^5}$$

Order the numbers from least to greatest.

60) 3.9×10^7 , 3.08×10^7 , 3.88×10^7

$$3.08 \times 10^7, 3.88 \times 10^7, 3.9 \times 10^7$$

61) 6.5×10^{-4} , 5.2×10^{-3} , 8.1×10^{-5}

$$8.1 \times 10^{-5}, 6.5 \times 10^{-4}, 5.2 \times 10^{-3}$$

Evaluate the expression. Write your answer in scientific notation.

62) $(8.3 \times 10^6) - (4.6 \times 10^6)$

$$\boxed{3.7 \times 10^6}$$

63) $(4.1 \times 10^3) + (3.7 \times 10^2)$

$$(4.1 \times 10^3) + (.37 \times 10^3) \\ = \boxed{4.47 \times 10^3}$$

64) $(9.3 \times 10^{-3}) - (6.9 \times 10^{-4})$

$$(9.3 \times 10^{-3}) - (.69 \times 10^{-3}) \\ = \boxed{8.61 \times 10^{-3}}$$

65) $(3.1 \times 10^7) + (5.5 \times 10^5)$

$$(3.1 \times 10^7) + (.055 \times 10^7) \\ = \boxed{3.155 \times 10^7}$$

$$66) (1.2 \times 10^{-3}) \times (4 \times 10^5)$$

$$\boxed{4.8 \times 10^2}$$

$$67) (8 \times 10^{-4}) \div (4 \times 10^3)$$

$$\boxed{2 \times 10^{-7}}$$

$$68) (9 \times 10^{-4}) \div (3 \times 10^{-2})$$

$$\boxed{3 \times 10^{-2}}$$

$$69) (1.1 \times 10^8) \times (4 \times 10^7)$$

$$\boxed{4.4 \times 10^{15}}$$

$$70) (8.3 \times 10^3) \times (3 \times 10^{-6})$$

$$24.9 \times 10^{-3}$$

$$= \boxed{2.49 \times 10^{-2}}$$

$$71) (8 \times 10^{-6}) \div 1.6$$

$$\boxed{5 \times 10^{-6}}$$