

$$1. \quad 64^{\frac{1}{3}}$$

$$\sqrt[3]{64}$$

$$= 4$$

$$2. \quad 42^{\frac{5}{4}}$$

$$(\sqrt[4]{42})^5$$

$$3. \quad 4^{2.5} \leftarrow \text{tenths}$$

$$4^{\frac{25}{10}}$$

$$4^{\frac{5}{2}}$$

$$(\sqrt{4})^5$$

$$2^5$$

$$= 32$$

$$4. \quad \left(\frac{125}{8}\right)^{\frac{1}{3}}$$

$$\frac{(\sqrt[3]{125})}{(\sqrt[3]{8})^4}$$

$$\frac{5^4}{2^4}$$

$$= \frac{625}{16}$$

$$5. \quad \left(\frac{-243}{32}\right)^{0.8}$$

$$\frac{(-243)^{\frac{8 \div 2}{10 \div 2}}}{(32)^4}$$

$$\left(\frac{-243}{32}\right)^{\frac{4}{5}}$$

$$\frac{(\sqrt[5]{-243})^4}{(\sqrt[5]{32})^4}$$

$$\frac{(-3)^4}{(2)^4}$$

$$= \frac{81}{16}$$

$$\frac{(\sqrt[3]{125})^4}{(\sqrt[3]{8})^4}$$

$$\frac{5^4}{2^4}$$

$$= \frac{625}{16}$$

$$\frac{(-243)^{\frac{8}{10} \div 2}}{32}$$

$$\left(\frac{-243}{32}\right)^{\frac{4}{5}}$$

$$\frac{(\sqrt[5]{-243})^4}{(\sqrt[5]{32})^4}$$

$$\frac{(-3)^4}{(2)^4}$$

$$= \frac{81}{16}$$

6. $9^{\frac{2}{3}}, \sqrt[3]{9}, 9^{\frac{1}{2}}, \sqrt{9^3}, 9^{1.2}$

$\underline{9^{\frac{2}{3}}}, 9^{\frac{1}{3}}, 9^{\frac{1}{2}}, \underline{9^{\frac{3}{2}}}, \underline{9^{1.2}}$

$= 9^{\frac{3}{2}}, 9^{1.2}, 9^{\frac{2}{3}}, 9^{\frac{1}{2}}, 9^{\frac{1}{3}}$

$$7. \left(\frac{2}{3}\right)^{-3} \\ \left(\frac{3}{2}\right)^3 \\ \frac{3^3}{2^3} \\ = \frac{27}{8}$$

$$8. 64^{-4/3} \\ \frac{1}{64^{4/3}} \\ \frac{1}{(\sqrt[4]{64})^3} \\ \frac{1}{4^3} \\ \frac{1}{64}$$

$$9. (-216)^{1/3} \\ \sqrt[3]{-216} \\ = -6$$

$$10. 49^{-0.5} \\ = \frac{1}{49^{0.5}}$$

$$11. 81^{-0.75} \\ = \frac{1}{81^{0.75}}$$

$$12. \frac{1}{125}$$

$$2^3 = \frac{27}{8}$$

$$\begin{aligned} & \left(\sqrt[4]{64} \right) \\ & \frac{1}{4^3} \\ & \frac{1}{64} \end{aligned}$$

$$= -6$$

$$\begin{aligned} 10. \quad & 49^{-0.5} \\ & = \frac{1}{49^{0.5}} \\ & = \frac{1}{49^{1/2}} \\ & = \frac{1}{\sqrt{49}} \\ & = \frac{1}{7} \end{aligned}$$

$$\begin{aligned} 11. \quad & 81^{-0.75} \\ & = \frac{1}{81^{0.75}} \\ & = \frac{1}{81^{3/4}} \\ & = \frac{1}{81^{3/4}} \\ & = \left(\sqrt[4]{81} \right)^3 \\ & = \frac{1}{3^3} \\ & = \frac{1}{27} \end{aligned}$$

$$\begin{aligned} 12. \quad & \frac{1}{125} \\ & = \frac{1}{5^3} \quad \curvearrowright \\ & = 5^{-3} \end{aligned}$$

$$13. \quad \frac{(3 \cdot 5^{-6})(3 \cdot 5^5)}{(3 \cdot 5^{-1})}$$

$$= \frac{3 \cdot 5^{-1}}{3 \cdot 5^{-1}} \quad \begin{array}{l} -1 \ominus -1 \\ -1 + 1 = 0 \end{array}$$

$$= 3 \cdot 5^0$$

$$= 1$$

$$14. (a) \quad \left(\frac{5^3 a^{-4} b^7}{2} \right)^{-3}$$

$$= \frac{2^{-3} a^{12} b^{-21}}{5^{-3}}$$

$$= \frac{5^3 a^{12}}{2^3 b^{21}}$$

$$= \frac{125 a^{12}}{8 b^{21}}$$

$$(b) \quad m^{-2} n^6 \times m^3 n^{-8}$$

$$= m^{-2+3} n^{6-8}$$

$$= \frac{m}{n^2}$$

$$= \frac{125 a^{12}}{8 b^{21}}$$

$$= \frac{125 a^{12}}{8 b^{21}}$$

$$(d) \left(\frac{w^{-15} y^{12}}{-64 x^3} \right)^{-\frac{1}{3}}$$

$$= \frac{w^5 y^{-4}}{-64^{-\frac{1}{3}} x^{-1}}$$

$$= \frac{(-64)^{\frac{1}{3}} w^5 x^1}{y^4}$$
$$= \frac{-4 w^5 x^1}{y^4}$$

$$-\frac{15}{1} \times -\frac{1}{3} = \frac{15}{3}$$
$$= 5$$

$$\frac{12}{1} \times -\frac{1}{3} = -\frac{12}{3}$$
$$= -4$$

$$(-64)^{-\frac{1}{3}}$$

$$\frac{3}{1} \times -\frac{1}{3} = -\frac{3}{3}$$
$$= -1$$

$$(d) \frac{(m^3 n^{-3})^{-1}}{(m^{-2} n^4)^4}$$

$$= \frac{m^{-3} n^3}{m^{-8} n^4}$$

$$= m^5 n^{-1}$$

$$= \frac{m^5}{n^1}$$

$$\begin{array}{l} \textcircled{-3 - -8} \\ \textcircled{-3 + 8 = 5} \\ \textcircled{3 - 4 = -1} \end{array}$$

1

1 - 5 x 2.

$$15. \quad \frac{0.64^{\frac{1}{2}}}{0.64^5} \quad \frac{1 - \frac{5 \times 2}{2}}{\frac{7 - 10}{2}} = \frac{-3}{2}$$

$$0.64^{-3/2}$$

$$\frac{1}{0.64^{3/2}}$$

$$\frac{1}{(\sqrt{0.64})^3}$$

$$\frac{1}{0.8^3}$$

$$\frac{1}{0.512}$$

16. $(a^{-4}b^{-3})(a^3b^{-4})$ for $a=-1, b=3.$

$$= a^{-1}b^{-7}$$

$$= \frac{1}{a^1b^7}$$

$$= \frac{1}{(-1)(3)^7}$$

$$= \frac{1}{(-1)(2187)}$$

$$= -\frac{1}{2187}$$

17. $\left(\frac{3}{-11}\right)^{5/6}$

$$= -\frac{1}{2187}$$

$$17. \left(\frac{3}{4}\right)^{5/6}$$

$$\left(\frac{\sqrt[6]{3}}{\sqrt[6]{4}}\right)^5 \text{ or } \frac{(\sqrt[6]{3})^5}{(\sqrt[6]{4})^5}$$

$$\begin{aligned} 18. &= \frac{-3a^{-3}b^{-7}c^{-6}}{12a^{-6}b^{-3}c^{-3}} \\ &= \frac{-1a^3b^{-4}c^{-3}}{4} \\ &= \frac{-1a^3}{4b^4c^3} \end{aligned}$$

$$\begin{aligned} -3 - 6 \\ -3 + 6 = 3 \end{aligned}$$

$$\begin{aligned} -7 - 3 \\ -7 + 3 = -4 \end{aligned}$$

$$\begin{aligned} -6 - 3 \\ -6 + 3 \\ = -3 \end{aligned}$$

20. $(\sqrt[8]{X})(\sqrt[5]{X^3})$

$$X^{1/8} \times X^{3/5}$$

$$X^{29/40}$$

$$\frac{1 \times 5}{8 \times 5} + \frac{3 \times 8}{5 \times 8}$$

$$\frac{5}{40} + \frac{24}{40}$$

$$= \frac{29}{40}$$