

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

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

$$= 4$$

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

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

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

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

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

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

$$2^5$$

$$= 32$$

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

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

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

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

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

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

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

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

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

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

$$\frac{(-3)^4}{(2)^4} = \frac{81}{16}$$

6. $9^{\frac{2}{3}}, \sqrt[3]{9}, 9^{\frac{1}{2}}, \sqrt{9^3}, 9^{1.2}$
 $\underline{\underline{9^{\frac{2}{3}}}}, \overset{\textcircled{0.6}}{9^{\frac{2}{3}}}, \overset{\textcircled{0.3}}{9^{\frac{1}{3}}}, \overset{\textcircled{0.5}}{9^{\frac{1}{2}}}, \overset{\textcircled{1.5}}{9^{\frac{3}{2}}}, \overset{\textcircled{1.2}}{9}$
 $= 9^{\frac{3}{2}}, 9^{1.2}, 9^{\frac{2}{3}}, 9^{\frac{1}{2}}, 9^{\frac{1}{3}}$

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

$$\left(\frac{3}{2}\right)^3$$

$$\frac{3^3}{2^3}$$

$$= \frac{27}{8}$$

$$8. 64^{-4/3}$$

$$\frac{1}{64^{4/3}}$$

$$\frac{1}{(\sqrt[3]{64})^4}$$

$$\frac{1}{4^4}$$

$$\frac{1}{256}$$

$$9. (-216)^{1/3}$$

$$\sqrt[3]{-216}$$

$$= -6$$

$$10. \quad 49^{-0.5}$$

$$= \frac{1}{49^{0.5}}$$

$$= \frac{1}{49^{1/2}}$$

$$= \frac{1}{\sqrt{49}}$$

$$= \frac{1}{7}$$

$$11. \quad 81^{-0.75}$$

$$= \frac{1}{81^{0.75}}$$

$$= \frac{1}{81^{75/100}}$$

$$= \frac{1}{81^{3/4}}$$

$$= \frac{1}{(\sqrt[4]{81})^3}$$

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

$$= \frac{1}{27}$$

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

$$= \frac{1}{5^3}$$

$$= 5^{-3}$$

$$125^{-1}$$

$$13. \quad \frac{(3.5^{-6})(3.5^5)}{(3.5^{-1})}$$

$$= \frac{3.5^{-1}}{3.5^{-1}} \quad \begin{array}{l} -1 \ominus -1 \\ -1 + 1 \end{array}$$

$$= 3.5^0$$

$$= 1$$

$$= \frac{3.5^{-1}}{3.5^{-1}} \quad -1 \ominus -1$$

$$= 3.5^0 \quad -1+1=0$$

$$= 1$$

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

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

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

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

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

$$= m^1 n^{-2}$$

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

$8b^{21}$

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

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

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

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

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

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

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

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

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

$$3 - 4 = -1$$

15. $\frac{0.64^{\frac{1}{2}}}{0.64^5}$

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

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

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

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

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

1000

$$\frac{1 - 5 \times 2}{2 \times 1 \times 2}$$

$$\frac{7 - 10}{2}$$

$$= \frac{-3}{2}$$

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

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

18. $= \frac{-3a^{-3}b^{-7}c^{-6}}{12a^{-6}b^{-3}c^{-3}}$

$-3 - 6$
 $-3 + 6 = 3$

$= \frac{-1a^3b^{-4}c^{-3}}{4}$

$-7 - 3$
 $-7 + 3 = -4$

$= \frac{-1a^3}{4b^4c^3}$

$-6 - 3$
 $-6 + 3$
 $= -3$

20. $(\sqrt[8]{x})(\sqrt[5]{x^3})$
 $x^{1/8} \times x^{3/5}$
 $x^{29/40}$

$$\frac{1 \times 5}{8 \times 5} + \frac{3 \times 8}{5 \times 8}$$
$$\frac{5}{40} + \frac{24}{40}$$
$$= \frac{29}{40}$$