

1. $64^{\frac{1}{3}}$
 $\sqrt[3]{64}$
 $= 4$

2. $42^{\frac{5}{4}}$
 $(\sqrt[4]{42})^5$

3. $4^{2.5}$ ← tenths
 $4^{\frac{25}{10}}$
 $4^{\frac{5}{2}}$
 $(\sqrt{4})^5$
 2^5
 $= 32$

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

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

$$4. \left(\frac{125}{8} \right)^{7/3}$$

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

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

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

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

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

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

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

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

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

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

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

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

$\textcircled{0.6}$ $\textcircled{0.3}$ $\textcircled{0.5}$ $\textcircled{1.5}$ $\textcircled{1.2}$

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

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

8. $64^{-4/3}$
 $\frac{1}{64^{4/3}}$
 $\frac{1}{(\sqrt[3]{64})^4}$
 $\frac{1}{4^4}$
 $\frac{1}{256}$

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

10. $49^{-0.5}$

11. $01^{-0.75}$

12. 1

10. $49^{-0.5}$

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

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

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

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

11. $81^{-0.75}$

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

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

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

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

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

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

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

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

$$= 5^{-3}$$

$$\begin{aligned} 13. \quad & \frac{(3.5^{-6})(3.5^5)}{(3.5^{-1})} \\ & = \frac{3.5^{-1}}{3.5^{-1}} \quad -1 \ominus -1 \\ & \quad \quad \quad -1 + 1 = 0 \\ & = 3.5^0 \\ & = 1 \end{aligned}$$

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

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

$$= 1$$

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

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

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

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

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

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

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

c) $\left(\frac{W^{-15} y^{12}}{-64 x^3} \right)^{-3}$

$$\frac{W^{45} y^{-36}}{-64 x^{-9}}$$

$$\frac{-64^3 W^{45} x^9}{y^{36}}$$

$$\frac{-262144 W^{45} x^9}{y^{36}}$$

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

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

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

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

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

#15.

$$\frac{0.64^7}{0.64^5}$$
$$= 0.64^2$$
$$= 0.4096$$

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

$$= a^{-1}b^{-7}$$
$$= \frac{1}{a^1b^7}$$
$$= \frac{1}{(-1)(2187)}$$
$$= -\frac{1}{2187}$$

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

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

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

18,

$$\frac{-(3)^1 a^{-3} b^{-7} c^{-6}}{(3)^2 a^{-6} b^{-3} c^{-3}}$$

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

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

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

$$19. a) (x^{-6}y^6) (x^{-\frac{1}{6}}y^5)$$

$$x^{-\frac{37}{6}}y^{11}$$

$$\frac{y^{11}}{x^{\frac{37}{6}}}$$

$$\frac{-6x^6 + -1}{1x^6 \quad 6}$$

$$\frac{-36}{6} + \frac{-1}{6}$$

$$= \frac{-37}{6}$$

$$b) \left(\frac{2m^{\frac{1}{4}}}{n^4} \right)^{-4}$$

$$= \frac{2^{-4} m^{-4/4}}{n^{-16}}$$

$$= \frac{2^{-4} m^{-1}}{n^{-16}}$$

$$= \frac{n^{16}}{2^4 m} = \frac{n^{16}}{16 m^1}$$