

P.2 pg. 25 pg. 25 11-43 odd, 65-85 odd, 95, 97, 103-117 odd

11. a) $3^3 = \boxed{27}$

b) $3^4 = \boxed{81}$

13. a) $(3^3)^0 = \boxed{1}$

b) $-3^2 = \boxed{-9}$

15 a) $3^{1-(-4)} = 3^5$
 $= \boxed{243}$

b) $\frac{48}{-4^3} = \frac{48}{-64} = \boxed{-\frac{3}{4}}$

17 a) $\frac{1}{2} + \frac{1}{3} = \frac{3}{6} + \frac{2}{6}$
 $= \boxed{\frac{5}{6}}$

①9 $(-4)^3 \cdot 5^2 = -64 \cdot 25$
 $= \boxed{-1600}$

②1 $\frac{3^6}{7^3} = \boxed{2.125}$

23 $-3(2)^3 = -3 \cdot 8$
 $= \boxed{-24}$

②5 $6(10)^0 = 6 \cdot 1$
 $= \boxed{6}$

27 $2 \cdot (-3)^3 = 2(-27)$
 $= \boxed{-54}$

②9 $-20\left(-\frac{1}{2}\right)^2 = -20\left(\frac{1}{4}\right)$
 $= \boxed{-5}$

31 a) $(-5z)^3 = (-5)^3 z^3$
 $= \boxed{-125z^3}$

b) $5x^4(x^2) = \boxed{5x^6}$

33. a) $6y^2(2y^0)^2 = 6y^2(2 \cdot 1)^2$
 $= 6y^2 \cdot 4$
 $= \boxed{24y^2}$

b) $\frac{3x^5}{x^2} = 3x^{5-2}$
 $= \boxed{3x^3}$

$$35 \text{ a) } \frac{7x^2}{x^3} = \boxed{\frac{7}{x}}$$

$$\text{b) } \frac{12(x+y)^2}{9(x+y)} = \boxed{\frac{4(x+y)^2}{3}}$$

$$37 \text{ a) } [(x^2 y^{-2})^{-1}]^{-1} = (x^{-2} y^2)^{-1}$$

$$= \frac{x^2 y^{-2}}{y^2}$$

$$= \boxed{\frac{x^2}{y^2}}$$

$$\text{b) } \left(\frac{a^{-2}}{b^{-2}}\right) \left(\frac{b}{a}\right)^3 = \left(\frac{b^2}{a^2}\right) \left(\frac{b^3}{a^3}\right)$$

$$= \boxed{\frac{b^5}{a^5}}$$

$$39 \text{ a) } (x+5)^0 = \boxed{1}$$

$$\text{b) } (2x^{-2})^{-2} = 2^{-2} x^4$$

$$= \boxed{\frac{x^4}{4}}$$

$$41 \text{ a) } (-2x^2)^3 (4x^3)^{-1} = -2^3 x^6 \cdot 4^{-1} x^{-3}$$

$$= \frac{-8x^6}{4x^3}$$

$$= \boxed{-2x^3}$$

$$\text{b) } \left(\frac{x}{10}\right)^{-1} = \boxed{\frac{10}{x}}$$

P.2

$$43. a) 3^n \cdot 3^{2n} = 3^{n+2n} \\ = 3^{3n} \\ = \boxed{27^n}$$

$$b) \left(\frac{a^{-2}}{b^{-2}}\right) \left(\frac{b}{a}\right)^3 = \boxed{\frac{b^5}{a^5}}$$

37b

$$65. a) \sqrt{9} = \boxed{3}$$

$$b) \sqrt[3]{\frac{27}{8}} = \frac{\sqrt[3]{27}}{\sqrt[3]{8}} \\ = \boxed{\frac{3}{2}}$$

$$67. a) \frac{1}{(\sqrt[5]{32})^3} = \frac{1}{2^3} \\ = \boxed{\frac{1}{8}}$$

$$b) \left(\frac{16}{81}\right)^{-\frac{3}{4}} = \left(\frac{81}{16}\right)^{\frac{3}{4}} \\ = \frac{(\sqrt[4]{81})^3}{(\sqrt[4]{16})^3} \\ = \frac{3^3}{2^3} = \boxed{\frac{27}{8}}$$

$$69. a) \left(-\frac{1}{64}\right)^{-\frac{1}{3}} = (-64)^{\frac{1}{3}} \\ = \boxed{-4}$$

$$b) \left(\frac{1}{\sqrt{32}}\right)^{-\frac{2}{5}} = (\sqrt{32})^{\frac{2}{5}} \\ = \left((32)^{\frac{1}{2}}\right)^{\frac{2}{5}} \\ = (32)^{\frac{1}{5}} \\ = \sqrt[5]{32} \\ = \boxed{2}$$

$$71. a) \sqrt{57} = \boxed{7.550}$$

$$b) \sqrt[5]{-27^3} = \boxed{-7.225}$$

$$73. a) (-12.4)^{-1.8} = \boxed{-0.011}$$

$$b) (5\sqrt{3})^{-2.5} = \boxed{0.005}$$

$$75. \quad a) \sqrt{4.5 \times 10^9} = \boxed{67082.039} \quad b) \sqrt[3]{6.3 \times 10^4} = \boxed{39.791}$$

$$77. \quad a) (\sqrt[5]{2})^5 = (2^{\frac{1}{5}})^5 = \boxed{2}$$

$$b) \sqrt[5]{96x^5} = \sqrt[5]{96} \sqrt[5]{x^5} \\ = \sqrt[5]{32 \cdot 3} x \\ = \sqrt[5]{32} \sqrt[5]{3} x \\ = \boxed{2x \sqrt[5]{3}}$$

$$79. \quad a) \sqrt{20} = \sqrt{4 \cdot 5} \\ = \sqrt{4} \sqrt{5} \\ = \boxed{2\sqrt{5}}$$

$$b) \sqrt[3]{128} = \sqrt[3]{64 \cdot 2} \\ = \sqrt[3]{64} \sqrt[3]{2} \\ = \boxed{4\sqrt[3]{2}}$$

$$81. \quad a) \sqrt{72x^3} = \sqrt{36 \cdot 2x^2x} \\ = \boxed{6x \sqrt{2x}}$$

$$b) \sqrt{\frac{18^2}{2^3}} = \frac{\sqrt{18^2}}{\sqrt{2^2 \cdot 2}} \\ = \frac{18}{2\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} \\ = \boxed{\frac{18\sqrt{2}}{2^2}}$$

$$83. \quad a) \sqrt[3]{16x^5} = \sqrt[3]{8 \cdot 2 \cdot \sqrt[3]{x^3} \sqrt[3]{x^2}} \\ = \sqrt[3]{8} \sqrt[3]{2} \sqrt[3]{x^3} \sqrt[3]{x^2} \\ = \boxed{2x \sqrt[3]{2x^2}}$$

$$b) \sqrt{75x^2y^{-4}} = \sqrt{25 \cdot 3} \sqrt{x^2} \sqrt{y^{-4}} \\ = 5\sqrt{3} \cdot x \cdot y^{-2} \\ = \boxed{\frac{5x\sqrt{3}}{y^2}}$$

P.2

$$\begin{aligned} 85. \quad a) \quad 2\sqrt{50} + 12\sqrt{8} &= 2\sqrt{25 \cdot 2} + 12\sqrt{4 \cdot 2} \\ &= 2\sqrt{25}\sqrt{2} + 12\sqrt{4}\sqrt{2} \\ &= 2 \cdot 5\sqrt{2} + 12 \cdot 2\sqrt{2} \\ &= 10\sqrt{2} + 24\sqrt{2} \\ &= \boxed{34\sqrt{2}} \end{aligned}$$

$$\begin{aligned} b) \quad 10\sqrt{32} - 6\sqrt{18} &= 10\sqrt{16 \cdot 2} - 6\sqrt{9 \cdot 2} \\ &= 10\sqrt{16}\sqrt{2} - 6\sqrt{9}\sqrt{2} \\ &= 10 \cdot 4\sqrt{2} - 6 \cdot 3\sqrt{2} \\ &= 40\sqrt{2} - 18\sqrt{2} \\ &= \boxed{22\sqrt{2}} \end{aligned}$$

$$95. \quad \frac{1}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \boxed{\frac{\sqrt{3}}{3}}$$

$$\begin{aligned} 97. \quad \frac{5}{\sqrt{14} - 2} \cdot \frac{\sqrt{14} + 2}{\sqrt{14} + 2} &= \frac{5\sqrt{14} + 10}{14 - 4} \\ &= \frac{5\sqrt{14} + 10}{10} \\ &= \boxed{\frac{\sqrt{14}}{2} + 1} \end{aligned}$$

$$103. \quad 2.5^{\frac{1}{2}}$$

$$105. \quad \sqrt[4]{81}$$

$$107. \quad -216^{\frac{1}{3}}$$

$$109. \quad 81^{\frac{3}{4}}$$

$$\begin{aligned}
 \text{III. } \frac{(2x^2)^{\frac{3}{2}}}{2^{\frac{1}{2}}x^4} &= \frac{2x^3}{\sqrt{2}x^4} \\
 &= \frac{2}{x\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} \\
 &= \frac{2\sqrt{2}}{2x} \\
 &= \boxed{\frac{\sqrt{2}}{x}}
 \end{aligned}$$

$$\begin{aligned}
 \text{III. } \frac{x^{-3} \cdot x^{\frac{1}{2}}}{x^{\frac{3}{2}} \cdot x^{-1}} &= \frac{x^1 \cdot x^{\frac{1}{2}}}{x^{\frac{3}{2}} \cdot x^{\frac{3}{2}}} \\
 &= \frac{x^{\frac{3}{2}}}{x^{\frac{9}{2}}} \\
 &= x^{\frac{3}{2} - \frac{9}{2}} \\
 &= x^{-6/2} \\
 &= \boxed{\frac{1}{x^3}} \quad x \neq 0
 \end{aligned}$$

$$\begin{aligned}
 \text{115. a) } \sqrt[4]{3^2} &= 3^{\frac{2}{4}} \\
 &= \boxed{3^{\frac{1}{2}}}
 \end{aligned}$$

$$\begin{aligned}
 \text{b) } \sqrt[6]{(x+1)^4} &= (x+1)^{\frac{4}{6}} \\
 &= \boxed{(x+1)^{\frac{2}{3}}}
 \end{aligned}$$

$$\begin{aligned}
 \text{117. a) } \sqrt{\sqrt{32}} &= (32^{\frac{1}{2}})^{\frac{1}{2}} \\
 &= 32^{\frac{1}{4}} \\
 &= \boxed{\sqrt[4]{32}} = \sqrt[4]{16 \cdot 2} = \boxed{2\sqrt{2}}
 \end{aligned}$$

$$\begin{aligned}
 \text{b) } \sqrt{\sqrt[4]{2x}} &= (2x)^{\frac{1}{4} \cdot \frac{1}{2}} \\
 &= (2x)^{\frac{1}{8}} \\
 &= \boxed{\sqrt[8]{2x}}
 \end{aligned}$$