

## Additional Exercises Answers

### 7.1 Form I

1. 7 2. Not a real number 3. -3 4. 4 5. 2 6. Not a real number 7. 2 8. -3 9. 3  
10.  $|x+4|$  11.  $a+7$  12.  $m$  13.  $2|x|$  14.  $|x+6|$  15.  $-3x$  16. 4 17. 6 18. 0  
19.  $[7, \infty)$  20.  $(-\infty, 2]$

### 7.1 Form II

1. Not a real number 2. -20 3. -4 4. 5 5. Not a real number 6. -10 7. 2 8. 3  
9.  $|x+9|$  10.  $x-4$  11.  $ab$  12.  $|x-3|$  13.  $|x-4|$  14.  $3(x+1)$  15.  $-|x+2|$  16.  $\frac{1}{2}|x|$   
17. -3 18. 7 19.  $[-4, \infty)$  20.  $(-\infty, 6]$

### 7.1 Form III

1. 19 2. -12 3. -3 4. Not a real number 5.  $\frac{4}{5}$  6.  $\frac{-1}{5}$  7. 1 8. -0.5 9.  $|x-8|$   
10.  $|x+5|$  11.  $x+1$  12.  $3|x+3|$  13.  $-3y$  14. -8 15.  $[-6, \infty)$  16.  $(-\infty, 7]$   
17. -4 18. 6 19. -4 20. 35 miles per hour

### 7.2 Form I

1.  $\sqrt{64} = 8$  2.  $\sqrt[3]{27} = 3$  3.  $\sqrt{5xy}$  4.  $(\sqrt[5]{32})^2 = 4$  5.  $10^{\frac{1}{2}}$  6.  $(4x)^{\frac{1}{5}}$  7.  $8^{\frac{2}{3}}$  8.  $16^{\frac{5}{4}}$   
9.  $\frac{1}{49^{\frac{1}{2}}} = \frac{1}{7}$  10.  $\frac{1}{16^{\frac{3}{4}}} = \frac{1}{8}$  11.  $\frac{1}{(-27)^{\frac{2}{3}}} = \frac{1}{9}$  12.  $\frac{1}{100^{\frac{3}{2}}} = \frac{1}{1000}$  13.  $x$  14.  $a^{\frac{3}{5}}$   
15.  $10x^4y^2$  16.  $x^9y^8$  17.  $x^{\frac{5}{10}} = \sqrt{x}$  18.  $(3y)^{\frac{1}{5}} = \sqrt[5]{3y}$  19.  $x^{\frac{4}{9}} = \sqrt[9]{x^4}$  20.  $10^{\frac{1}{6}} = \sqrt[6]{10}$

### 7.2 Form II

1. 14 2. -5 3.  $\sqrt[5]{4xy^4}$  4.  $(\sqrt[4]{81})^3 = 27$  5.  $21^{\frac{1}{2}}$  6.  $(9x)^{\frac{1}{9}}$  7.  $(x^6y)^{\frac{1}{7}}$  8.  $(-27y)^{\frac{4}{3}}$   
9.  $\frac{1}{81^{\frac{3}{2}}} = \frac{1}{729}$  10.  $\frac{1}{(-27)^{\frac{1}{3}}} = \frac{-1}{3}$  11.  $\frac{1}{(4xy^2)^{\frac{3}{4}}} = \frac{1}{(\sqrt[4]{4xy^2})^3}$  12.  $\frac{4}{x^{\frac{1}{3}}}$  13.  $a^2$  14.  $y^{\frac{1}{2}}$   
15.  $-3x^3y^4$  16.  $\frac{y^{\frac{2}{5}}}{x^{\frac{8}{3}}}$  17.  $\sqrt[4]{4x}$  18.  $y^{\frac{13}{20}} = \sqrt[20]{y^{13}}$  19.  $12^{\frac{1}{6}} = \sqrt[6]{12}$  20.  $\sqrt[3]{x^4y^8}$

### 7.2 Form III

1.  $\sqrt[3]{1000} = 10$  2.  $(\sqrt[3]{-216})^2 = 36$  3.  $(\sqrt[5]{9x^2y^3})^3$  4.  $(\sqrt{16})^3 + \sqrt{4} = 66$  5.  $30^{\frac{1}{3}}$  6.  $(10x^5)^{\frac{1}{8}}$   
7.  $(14xy)^{\frac{5}{2}}$  8.  $(16y^2)^{\frac{3}{4}}$  9.  $\frac{8}{x^{\frac{1}{2}}}$  10.  $\frac{1}{(-125)^{\frac{2}{3}}} = \frac{1}{25}$  11.  $\frac{1}{(3xy)^{\frac{1}{2}}}$  12.  $\frac{1}{25^{\frac{1}{2}}} + \frac{1}{125^{\frac{1}{3}}} = \frac{2}{5}$   
13.  $y^{\frac{7}{8}}$  14.  $a^{\frac{5}{12}}$  15.  $25x^4y^8$  16.  $\frac{x}{2y^2z}$  17.  $x^{\frac{19}{15}} = \sqrt[15]{x^{19}}$  18.  $(6x)^{\frac{1}{3}} = \sqrt[3]{6x}$   
19.  $(xy)^{\frac{1}{40}} = \sqrt[40]{xy}$  20.  $20^{\frac{1}{15}} = \sqrt[15]{20}$

### 7.3 Form I

1.  $\sqrt{30}$  2.  $\sqrt[3]{12}$  3.  $\sqrt{x^2 - 16}$  4.  $\sqrt[3]{6x^2}$  5.  $3\sqrt{10}$  6.  $6\sqrt{3}$  7.  $3\sqrt{5x}$  8.  $2xy^2\sqrt[3]{5}$   
9.  $2x^4\sqrt[3]{3}$  10.  $2x^2y^2\sqrt[3]{6y}$  11.  $xy^2z^2\sqrt{z^2}$  12.  $(a+b)\sqrt[3]{(a+b)^2}$  13.  $(x-1)^2$   
14.  $10(x+3)^4$  15.  $x+2$  16.  $2\sqrt{15}$  17.  $6\sqrt{3}$  18.  $2y\sqrt{21x}$  19.  $2xy\sqrt[3]{6y^2}$   
20.  $2xy^2\sqrt[4]{10x^2}$

### 7.3 Form II

1.  $\sqrt[4]{28}$  2.  $\sqrt{x^2 + 2x - 8}$  3.  $\sqrt[3]{10x^2}$  4.  $\sqrt[5]{8x^3y^4}$  5.  $5\sqrt{3}$  6.  $5\sqrt{6}$  7.  $2\sqrt[3]{9}$   
8.  $2x^2\sqrt{6y^2}$  9.  $2y^4\sqrt[4]{6x^3y}$  10.  $3x^2y^2\sqrt[3]{6y}$  11.  $2x^2\sqrt[5]{8x^2}$  12.  $(x+y)\sqrt[4]{x+y}$   
13.  $10(x-1)^4$  14.  $10(x+1)^2\sqrt[3]{3}$  15.  $|x+5|\sqrt{3}$  16.  $9\sqrt{2}$  17.  $4x^3\sqrt{6}$  18.  $3\sqrt[3]{4}$   
19.  $2\sqrt[4]{10}$  20.  $12\sqrt{2}$  miles per hour  $\approx 17$

### 7.3 Form III

1.  $\sqrt[5]{90}$  2.  $\sqrt{x^2 + 2x - 35}$  3.  $\sqrt[3]{6x^2y}$  4.  $\frac{\sqrt[4]{x}}{y}$  5.  $6\sqrt{5}$  6.  $2\sqrt[3]{12}$  7.  $4x\sqrt[4]{5}$  8.  $x^6\sqrt{x}$   
9.  $2xy^3z\sqrt[3]{z}$  10.  $2yz\sqrt[5]{2x^4z}$  11.  $x+1$  12.  $(x-3)\sqrt[6]{(x-3)^2}$  13.  $10(x+4)^2$  14.  $2(x+4)$   
15.  $4(2x+5)$  16.  $2\sqrt{30}$  17.  $6x^3\sqrt{2}$  18.  $3\sqrt[4]{3}$  19.  $2x^8y^4\sqrt[3]{3x^2y^2}$   
20.  $(x+1)^4\sqrt[9]{(x+1)^2}$

### 7.4 Form I

1.  $8\sqrt{5}$  2.  $7\sqrt{7}$  3.  $2\sqrt[3]{6}$  4.  $4\sqrt[3]{5} - 4\sqrt{5}$  5.  $23\sqrt{5}$  6.  $-\sqrt[3]{y}$  7.  $18x\sqrt{2xy}$  8. 0 9.  $\frac{5}{2}$   
10.  $\frac{\sqrt{13}}{5}$  11.  $\frac{\sqrt[3]{3}}{2}$  12.  $\frac{\sqrt{14}}{x}$  13.  $\frac{5\sqrt{2}}{7}$  14.  $\frac{2\sqrt{3}}{9}$  15.  $\frac{2\sqrt[3]{2}}{y^2}$  16. 5 17.  $\sqrt{11}$  18. 4  
19.  $2x^3\sqrt{2}$  20.  $5x^3\sqrt{2}$

**7.4 Form II**

1.  $27\sqrt{19}$  2.  $15\sqrt{10}$  3.  $3x^4\sqrt{20}$  4.  $8\sqrt{6}-6\sqrt[3]{6}$  5.  $23\sqrt{7}$  6.  $-\sqrt[3]{y^2}$  7.  $17a^2\sqrt{3b}$   
 8.  $8x\sqrt{5x}$  9.  $\frac{\sqrt{13}}{4}$  10.  $\frac{4x\sqrt{y}}{7}$  11.  $\frac{3}{7}$  12.  $\frac{\sqrt[3]{4}}{3}$  13.  $\frac{3\sqrt{2}}{y^2}$  14.  $2\sqrt[3]{2x}$  15.  $\frac{\sqrt{2x}}{2}$  16. 6  
 17.  $2\sqrt{6}$  18. 3 19.  $4x^4$  20.  $2y^2\sqrt[3]{5}$

**7.4 Form III**

1.  $2\sqrt{10x}$  2.  $9\sqrt{11}$  3.  $8\sqrt{14}-3\sqrt[3]{14}$  4.  $5\sqrt[3]{y}$  5.  $23\sqrt{7}$  6.  $7x^4\sqrt{x^3}+5x^4\sqrt{x}$   
 7.  $17a^2\sqrt{3b}$  8.  $5\sqrt{x-2}$  9.  $\frac{3}{5}$  10.  $\frac{5}{x^4}$  11.  $\frac{2\sqrt[3]{3}}{3}$  12.  $\frac{2\sqrt[4]{3}}{3}$  13.  $\frac{2\sqrt[3]{2}}{x^3}$  14.  $\frac{x\sqrt{5}}{3}$   
 15.  $\frac{4x\sqrt{2y}}{7}$  16.  $\frac{7}{3}$  17.  $\frac{5}{6}$  18.  $5x\sqrt{3}$  19.  $2x^2y^2\sqrt{15y}$  20.  $2b\sqrt{10}$

**7.5 Form I**

1.  $\sqrt{21}+\sqrt{15}$  2.  $\sqrt{30}-5$  3.  $\sqrt[3]{12}+2$  4.  $3\sqrt{21}-6\sqrt{6}$  5. -14 6.  $9+4\sqrt{5}$  7. 9 8.  $\frac{\sqrt{5}}{5}$   
 9.  $\frac{\sqrt{6x}}{x}$  10.  $\frac{\sqrt[3]{18}}{3}$  11.  $\frac{\sqrt[3]{20x^2}}{4x}$  12.  $\frac{\sqrt[3]{2x^2}}{4x}$  13.  $\frac{5}{6}+\frac{\sqrt{7}}{6}$  14.  $\frac{40+5\sqrt{3}}{61}$  15.  $4\sqrt{3}+4\sqrt{2}$   
 16.  $10-4\sqrt{5}$  17.  $\frac{7}{\sqrt{35}}$  18.  $\frac{5}{\sqrt{10}}$  19.  $\frac{6}{\sqrt{6}}$  20.  $\frac{11}{7a\sqrt{11}}$

**7.5 Form II**

1.  $\sqrt{35}-\sqrt{15}$  2. 5 3.  $\sqrt[3]{35}+\sqrt[3]{10}$  4.  $16-6\sqrt{7}$  5.  $3\sqrt[3]{x^2}-4x$  6.  $17+2\sqrt{30}$   
 7.  $2\sqrt{21}-2\sqrt{70}+3\sqrt{30}-30$  8.  $\frac{\sqrt{7}}{7}$  9.  $\frac{\sqrt{2xy}}{y}$  10.  $\frac{\sqrt[3]{6x^2}}{3x}$  11.  $\frac{\sqrt[5]{7y^4}}{y^2}$  12.  $\frac{\sqrt[3]{180xy^2}}{6xy}$   
 13.  $\frac{40+5\sqrt{5}}{59}$  14.  $\frac{3\sqrt{2}-2\sqrt{3}}{2}$  15.  $\frac{9+2\sqrt{14}}{5}$  16.  $3\sqrt{15}+3\sqrt{10}$  17.  $\frac{6}{\sqrt{30x}}$  18.  $\frac{17}{\sqrt{34}}$   
 19.  $\frac{24}{\sqrt{30}}$  20.  $\frac{5}{\sqrt{15x}}$

**7.5 Form III**

1.  $\sqrt[3]{18} + \sqrt[3]{12}$  2.  $81 - 56\sqrt{2}$  3.  $\sqrt{95} - \sqrt{133} + \sqrt{35} - 7$  4.  $8 + 2\sqrt{15}$  5.  $2\sqrt[4]{3} - \sqrt[4]{18}$  6.  $-21$   
 7.  $10x\sqrt[3]{2} - \sqrt[3]{x^2}$  8.  $\frac{6\sqrt{7}y}{7y}$  9.  $\frac{\sqrt[3]{21x}}{3x}$  10.  $\sqrt[3]{2x^2y}$  11.  $\frac{\sqrt[4]{18x^3}}{3x}$  12.  $\frac{4\sqrt{13y}}{13y}$  13.  $2\sqrt{6} + 4$   
 14.  $\frac{\sqrt{15} - \sqrt{6}}{3}$  15.  $\frac{30\sqrt{2} + 16\sqrt{5} - 3\sqrt{30} - 8\sqrt{3}}{13}$  16.  $\frac{36x + y + 12\sqrt{xy}}{y - 36x}$  17.  $\frac{7x}{\sqrt{5xy}}$  18.  $\frac{9}{4\sqrt{3}}$   
 19.  $\frac{47}{40 + 46\sqrt{2}}$  20.  $\frac{-1}{9 - 4\sqrt{5}}$

**7.6 Form I**

1. {25} 2. {33} 3. {80} 4. {65} 5. {29} 6. {4} 7. {180} 8. {20} 9. No Solution  
 10. {25} 11. {5} 12. {2} 13. {4} 14. {9} 15. {5} 16. {20} 17. {3, 4} 18. {0, 3}  
 19. {-6} 20. {4}

**7.6 Form II**

1. {64} 2. {5} 3. No Solution 4.  $\left\{\frac{75}{4}\right\}$  5. {11} 6. {19} 7. {14} 8. {3} 9. {5}  
 10. {1} 11. {12} 12. {-1} 13. {8} 14. {-4} 15. {8, -8} 16. {4} 17. {20} 18. {6}  
 19. {5, 8} 20. {2, 38}

**7.6 Form III**

1. {16} 2. {9} 3. No Solution 4. {8} 5. {1} 6. {4, 6} 7. {5} 8. {-4, 5} 9. {1}  
 10.  $\{\sqrt{7}\}$  11. {4} 12. {5} 13. {-1, 3} 14. {8} 15. {-2} 16. {27} 17. {2} 18. {2}  
 19. 160 feet 20. 2014

**7.7 Form I**

1.  $5i$  2.  $11i$  3.  $4i\sqrt{2}$  4.  $5i\sqrt{2}$  5.  $7 + 3i\sqrt{2}$  6.  $10 + 10i$  7.  $-8 + 9i$  8.  $6 + 3i$   
 9.  $10 - 15i$  10.  $24 + 12i$  11.  $52 - 64i$  12.  $-9 - 40i$  13.  $\frac{1}{5} + \frac{21}{10}i$  14.  $\frac{-4}{29} + \frac{19}{29}i$   
 15.  $-4 - 3i$  16.  $\frac{-5}{3} - 2i$  17.  $-1$  18.  $1$  19.  $-i$  20.  $-i$

**7.7 Form II**

1.  $14i$  2.  $2i\sqrt{10}$  3.  $5i\sqrt{3}$  4.  $8 - 7i$  5.  $-8 + 7i$  6.  $13 + 4i$  7.  $6 + 8i$  8.  $-15 - 9i$   
 9.  $29 - 29i$  10.  $15$  11.  $7 + 24i$  12.  $\frac{26}{33} - \frac{12}{11}i$  13.  $\frac{13}{15} - \frac{2}{5}i$  14.  $\frac{7}{25} - \frac{24}{25}i$  15.  $\frac{-5}{2} - 3i$   
 16.  $\frac{4}{29} + \frac{10}{29}i$  17.  $1$  18.  $-1$  19.  $-6i$  20.  $1$