

## Chapter R answers

### R.1

- |                |                  |                 |                 |                    |                  |
|----------------|------------------|-----------------|-----------------|--------------------|------------------|
| 1. $\{-4\}$    | 3. $\{-10/3\}$   | 5. $\{0\}$      | 7. $\{-3\}$     | 9. $\{-1\}$        | 11. $\{17/11\}$  |
| 13. $\{39/8\}$ | 15. $\{-6/5\}$   | 17. $\{27/17\}$ | 19. $\{0\}$     | 21. $\{0\}$        | 23. $\{1\}$      |
| 25. $\{-5/7\}$ | 27. $\{-6\}$     | 29. $\{5/24\}$  | 31. $\{15/8\}$  | 33. $\{12\}$       | 35. $\{-64/15\}$ |
| 37. $\{24/7\}$ | 39. $\{0\}$      | 41. $\{14/19\}$ | 43. $\{-8/31\}$ | 45. $\{7/5\}$      | 47. $\{23/19\}$  |
| 49. $\{14\}$   | 51. $\{55\}$     | 53. 160 hours   | 55. 35 min.     | 57. \$100,000      | 59. 3.5 sec.     |
| 61. $-40^0$    | 63. 5 ft X 10 ft | 65. 4 ft X 5 ft | 67. 20 cm       | 69. 5 m, 15 m, 2 m |                  |

### R.2 Graphs omitted

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|------------------------------------------------|--------------------------------------|------------------------------------------------|------------------------------------|--------------------------------------------------|--------------|
| 1. $[4, \infty)$                               | 3. $(-\infty, -4)$                   | 5. $(0, \frac{3}{2}]$                          | 7. $[-2, \infty)$                  | 9. $(-10, -5)$                                   |              |
| 11. $(-\infty, -3] \cup (2, \infty)$           | 13. $(-\infty, -2)$                  | 15. $(-9, \infty)$                             | 17. $[-\frac{1}{2}, \infty)$       |                                                  |              |
| 19. $(0, \infty)$                              | 21. $(-3, \infty)$                   | 23. $(-\infty, 3]$                             | 25. $(-\infty, 12)$                | 27. $(-\frac{64}{15}, \infty)$                   |              |
| 29. $[0, \infty)$                              | 31. $[-3, 3)$                        | 33. $(-1, \frac{3}{4})$                        | 35. $(\frac{17}{7}, \frac{45}{7})$ | 37. $[-3, 4)$                                    | 39. $[3, 5]$ |
| 41. $(\frac{5}{2}, 7)$                         | 43. $(-5, 0)$                        | 45. $[2, 10)$                                  | 47. $[-21, 1)$                     | 49. $(-\infty, -\frac{11}{3}) \cup (-3, \infty)$ |              |
| 51. $[4, \infty)$                              | 53. $[3, \infty)$                    | 55. $(-\infty, -\frac{5}{2}] \cup (3, \infty)$ | 57. $(-\infty, \infty)$            | 59. $(-\infty, \infty)$                          |              |
| 61. $(-\infty, 1)$                             | 63. $(-\infty, -3] \cup (3, \infty)$ | 65. $[-4, 1)$                                  | 67. $(4, \infty)$                  |                                                  |              |
| 69. $(-\infty, -\frac{5}{2}) \cup (3, \infty)$ |                                      |                                                |                                    |                                                  |              |

### R.3 Graphs omitted

- |                                       |                                                         |                                                          |                                  |                     |                  |
|---------------------------------------|---------------------------------------------------------|----------------------------------------------------------|----------------------------------|---------------------|------------------|
| 1. $\{-2, 2\}$                        | 3. $\{-7, 7\}$                                          | 5. $\{-5, 1\}$                                           | 7. $\{-2, 8\}$                   | 9. $\{-2, 0\}$      | 11. $\{1/2\}$    |
| 13. No Solution                       |                                                         | 15. $\{-1, -1/3\}$                                       | 17. $\{-2/5, 8/5\}$              | 19. $\{0, 2/5\}$    | 21. $\{-3, 11\}$ |
| 23. $\{1/2, 5/2\}$                    | 25. $\{-1\}$                                            | 27. No solution                                          |                                  | 29. $\{-1/3, 5/3\}$ |                  |
| 31. $(-\infty, -3) \cup (3, \infty)$  | 33. $[-4, 4]$                                           | 35. $(-\infty, -3] \cup [1, \infty)$                     | 37. $(4, 6)$                     |                     |                  |
| 39. $(-\infty, -4] \cup [8, \infty)$  | 41. $(-4, 3)$                                           | 43. $(-\infty, -2] \cup [\frac{14}{5}, \infty)$          | 45. No Solution                  |                     |                  |
| 47. $(-\infty, 0) \cup (1, \infty)$   | 49. $(-\frac{1}{2}, \frac{3}{2})$                       | 51. $(-\infty, -3] \cup [9, \infty)$                     | 53. $(-\infty, \infty)$          |                     |                  |
| 55. No Solution                       | 57. $(-\infty, \frac{1}{2}) \cup (\frac{1}{2}, \infty)$ | 59. $\{-1/3\}$                                           | 61. $(\frac{3}{2}, \frac{5}{2})$ |                     |                  |
| 63. $(-\infty, -5) \cup (12, \infty)$ | 65. $(-2, \frac{20}{7})$                                | 67. $(-\infty, -\frac{5}{4}] \cup [\frac{1}{4}, \infty)$ | 69. $[2, 6]$                     |                     |                  |
| 71. $(0, 2)$                          | 73. $(-\infty, \frac{1}{5}] \cup [\frac{3}{5}, \infty)$ | 75. $(-\infty, 2) \cup (3, \infty)$                      | 77. $[1, 3]$                     |                     |                  |

### R.4

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|-----------------------------------|-------------------------------------|--------------------------------------|--------------------|---------|--|
| 1. $5x - 4$                       | 3. $5x - 7$                         | 5. $x + 13$                          | 7. $6x^2 - 4x - 6$ | 9. $6x$ |  |
| 11. $-x^4 + x^3 + 4x^2 - 4x - 13$ | 13. $6x^4 + 6x^3 + 6x^2 - 12x - 11$ |                                      |                    |         |  |
| 15. $3x^3 - 6x^2 + 3x$            | 17. $x^2 + 7x + 12$                 | 19. $4x^2 + 12x + 9$                 |                    |         |  |
| 21. $x^2 - 100$                   | 23. $16x^6 - 24x^3 + 9$             | 25. $x^4 - x^3 + 5x^2 - 9x - 36$     |                    |         |  |
| 27. $x^4 + x^2 + 1$               | 29. $x^4 - y^4$                     | 31. $27x^3 - 54x^2y + 36xy^2 - 8y^3$ |                    |         |  |
| 33. $x^3 - 1$                     | 35. $x^5 - 1$                       | 37. $3x(x+5)(x+2)$                   |                    |         |  |
| 39. $u^2(u+8)(u-7)$               | 41. $(x+5)(x+y)$                    | 43. $4x(3x-4)(3x+4)$                 |                    |         |  |
| 45. $(x-d)(x+7)$                  | 47. $5(7x+1)(x-3)$                  | 49. $(y+8)(x-y)$                     |                    |         |  |
| 51. $(x+2y)(x^2 - 2xy + 4y^2)$    | 53. $2a(x-5)(x-6)$                  | 55. $(x+y)(x-y)(x^2 + y^2)$          |                    |         |  |
| 57. $(x+2)(x-2)(x+5)(x-5)$        | 59. $2x^2(2x+7)(2x+7)$              | 61. $(x-2)^3$                        |                    |         |  |

63.  $\{-2, 9\}$     65.  $\{-7\}$     67.  $\{0, 7\}$     69.  $\left\{0, \frac{4}{3}\right\}$     71.  $\{-1, 6\}$   
 73.  $W = 4 \text{ m}, L = 6 \text{ m}$     75.  $W = 3 \text{ in}, L = 11 \text{ in}$     77.  $b = 6 \text{ m}, h = 13 \text{ m}$   
 79. 2 sec    81.  $4\frac{3}{4}$  sec    83. 5 sec    85. 4 sec

### R.5

1.  $\frac{2x}{3y^2}$     3.  $\frac{x+8}{x+7}$     5.  $\frac{-1}{x+9}$     7.  $\frac{-10}{x}$     9.  $\frac{2}{9}$     11.  $\frac{1}{5x}$   
 13.  $5x - 2$     15.  $\frac{-3x+8}{x+7}$     17.  $\frac{1}{x-6}$     19.  $\frac{7}{36}$     21.  $\frac{3x-17}{(x-8)(x+5)}$   
 23.  $\frac{3x+1}{(x-9)(x+2)(x-2)}$     25.  $\frac{x-4}{x-6}$     27.  $\frac{3x}{x+3}$     29.  $\frac{x-3}{x+5}$     31.  $\frac{x+2}{x-4}$   
 33.  $\frac{x-7}{x-2}$     35.  $\{12\}$     37.  $\{32\}$     39.  $\{5\}$     41.  $\{-2, 4\}$     43.  $\{-1, 6\}$   
 45.  $\{-8\}$     47.  $W = \frac{P-2L}{2}$     49.  $c = \frac{2A-hb}{h}$     51.  $R = \frac{E-KL}{L}$   
 53.  $d = \frac{s-a}{n-1}$     55.  $a = \frac{3L}{ct+1}$     57.  $7\frac{1}{2}$  hrs    59. 27 min  
 61. 450 mph    63. 8 mph    65. 7 mph

### R.6

1. 2    3. -2    5. 1    7. 8    9. not a real number    11.  $\frac{1}{4}$     13.  $x$     15.  $a^3$   
 17.  $2\sqrt{2}$     19.  $3\sqrt{2}$     21.  $xy^2\sqrt{xy}$     23.  $a^2b^3\sqrt[3]{b}$     25.  $2x^3y^3\sqrt[4]{3xy^3}$   
 27.  $-x^3y^3z^6\sqrt[3]{100xyz^2}$     29.  $5\sqrt{2}$     31.  $\sqrt[3]{2x}$     33.  $7xy\sqrt{x}$     35.  $-\sqrt[4]{3}$   
 37.  $-t\sqrt[3]{2t}$     39.  $3b\sqrt[4]{3a^3}$     41.  $x^2y + 2x\sqrt{yz} + z$     43.  $a - 4\sqrt{ab} + 4b$   
 45.  $2x + \sqrt{x} - 6$     47.  $2 - 4\sqrt{2}$     49.  $\alpha - \beta\sqrt{\alpha\chi} - 2\beta^2\chi$     51.  $2p + \sqrt{pq} - 6q$   
 53.  $\frac{y\sqrt[4]{9x^3y}}{3x}$     55.  $\frac{\sqrt[5]{162x^2y^2}}{3y}$     57.  $-\sqrt{2} - 3$     59.  $\frac{x\sqrt{x-x}}{x-1}$     61.  $-\sqrt{2} - \sqrt{3}$   
 63.  $\frac{5\sqrt{x+10}\sqrt{y}}{x-4y}$     65. 35    67. 1    69.  $-24+23i$     71.  $26+7i$   
 73.  $\frac{1}{2} + \frac{1}{2}i$     75.  $\frac{8}{5} - \frac{1}{5}i$     77.  $\{10\}$     79.  $\{32\}$     81.  $\{-2, 2\}$   
 83.  $\{-1, 15\}$     85.  $\{4\}$     87.  $\{1/36\}$     89.  $\{7\}$     91.  $\{9/5\}$