

## Additional Exercises Answers

### 9.1 Form I

1.  $\{\pm 7\}$  2.  $\{\pm 9\}$  3.  $\{\pm\sqrt{11}\}$  4.  $\{\pm 2\sqrt{5}\}$  5.  $\{-12, -4\}$  6.  $\{-5, 1\}$  7.  $\{-2, 8\}$  8. 5 in.  
9.  $\sqrt{41}$  10.  $3\sqrt{10}$  11.  $3\sqrt{2}$  12.  $4\sqrt{5}$  13.  $\sqrt{197}$  14. 2019 15. 5 cm

### 9.1 Form II

1.  $\{\pm 6\}$  2.  $\{\pm\sqrt{7}\}$  3.  $\left\{\pm\frac{10\sqrt{7}}{7}\right\}$  4.  $\{-3, 9\}$  5.  $\{-5\pm 2\sqrt{10}\}$  6.  $\{-10\pm\sqrt{19}\}$   
7.  $\{-5\pm\sqrt{7}\}$  8. 25 in. 9.  $\sqrt{2}$  10.  $\sqrt{10}$  11.  $\sqrt{178}$  12.  $\sqrt{58}$  13.  $\sqrt{34}$  14. 4 sec  
15.  $48\sqrt{2}$  cm

### 9.1 Form III

1.  $\{\pm\sqrt{23}\}$  2.  $\{\pm 3\sqrt{3}\}$  3.  $\left\{\pm\frac{\sqrt{35}}{7}\right\}$  4.  $\{-2, 3\}$  5.  $\left\{\frac{-4\pm\sqrt{10}}{5}\right\}$  6.  $3\pm\sqrt{6}$   
7.  $\frac{1}{2}\pm\sqrt{2}$  8.  $4\sqrt{15}$  m 9.  $4\sqrt{2}$  10.  $4\sqrt{5}$  11. 13 12.  $2\sqrt{2}$  13.  $2\sqrt{10}$  14. 8 ft.  
15. 11 in.

### 9.2 Form I

1.  $x^2 + 10x + 25 = (x + 5)^2$  2.  $x^2 - 16x + 64 = (x - 8)^2$  3.  $x^2 + 8x + 16 = (x + 4)^2$   
4.  $x^2 - 4x + 4 = (x - 2)^2$  5.  $x^2 + 12x + 36 = (x + 6)^2$  6.  $x^2 - 22x + 121 = (x - 11)^2$   
7.  $x^2 + x + \frac{1}{4} = \left(x + \frac{1}{2}\right)^2$  8.  $x^2 - 5x + \frac{25}{4} = \left(x - \frac{5}{2}\right)^2$  9.  $x^2 + 18x + 81 = (x + 9)^2$   
10.  $x^2 - 7x + \frac{49}{4} = \left(x - \frac{7}{2}\right)^2$  11.  $-3, -9$  12.  $1\pm\sqrt{5}$  13.  $\left\{\frac{-3\pm 3\sqrt{5}}{2}\right\}$  14.  $\{5, 7\}$   
15.  $\{-5, 7\}$  16.  $\{-3\pm\sqrt{6}\}$  17.  $\left\{\frac{1\pm\sqrt{29}}{7}\right\}$  18.  $\left\{\frac{5\pm\sqrt{33}}{2}\right\}$  19.  $\{2\pm\sqrt{21}\}$  20.  $\left\{\frac{3}{2}, 3\right\}$

### 9.2 Form II

1.  $x^2 - 8x + 16 = (x - 4)^2$  2.  $x^2 + 20x + 100 = (x + 10)^2$  3.  $x^2 - 9x + \frac{81}{4} = \left(x - \frac{9}{2}\right)^2$   
4.  $x^2 + 3x + \frac{9}{4} = \left(x + \frac{3}{2}\right)^2$  5.  $x^2 - 5x + \frac{25}{4} = \left(x - \frac{5}{2}\right)^2$  6.  $x^2 + 11x + \frac{121}{4} = \left(x + \frac{11}{2}\right)^2$   
7.  $x^2 - 18x + 81 = (x - 9)^2$  8.  $x^2 + 13x + \frac{169}{4} = \left(x + \frac{13}{2}\right)^2$  9.  $x^2 - \frac{1}{2}x + \frac{1}{16} = \left(x - \frac{1}{4}\right)^2$

10.  $x^2 - x + \frac{1}{4} = \left(x - \frac{1}{2}\right)^2$  11.  $\{-6, 2\}$  12.  $\{-6 \pm \sqrt{19}\}$  13.  $\left\{0, \frac{7}{3}\right\}$  14.  $\{-2 \pm \sqrt{7}\}$   
 15.  $\{2 \pm \sqrt{17}\}$  16.  $\{-4 \pm 2\sqrt{5}\}$  17.  $\{5 \pm \sqrt{29}\}$  18.  $\{-4 \pm \sqrt{21}\}$  19.  $\{-4 \pm \sqrt{19}\}$   
 20.  $\left\{\frac{1}{2}, -\frac{2}{3}\right\}$

### 9.2 Form III

1.  $x^2 - 3x + \frac{9}{4} = \left(x - \frac{3}{2}\right)^2$  2.  $x^2 + 5x + \frac{25}{4} = \left(x + \frac{5}{2}\right)^2$  3.  $x^2 + 7x + \frac{49}{4} = \left(x + \frac{7}{2}\right)^2$   
 4.  $x^2 + 9x + \frac{81}{4} = \left(x + \frac{9}{2}\right)^2$  5.  $x^2 - 15x + \frac{225}{4} = \left(x - \frac{15}{2}\right)^2$  6.  $x^2 + \frac{1}{3}x + \frac{1}{36} = \left(x + \frac{1}{6}\right)^2$   
 7.  $x^2 - \frac{2}{3}x + \frac{1}{9} = \left(x - \frac{1}{3}\right)^2$  8.  $x^2 + \frac{4}{7}x + \frac{16}{196} = \left(x + \frac{4}{14}\right)^2$  9.  $x^2 + \frac{1}{2}x + \frac{1}{16} = \left(x + \frac{1}{4}\right)^2$   
 10.  $x^2 - \frac{1}{4}x + \frac{1}{64} = \left(x - \frac{1}{8}\right)^2$  11.  $\{-3, 1\}$  12.  $\{-2, 8\}$  13.  $\{2 \pm \sqrt{15}\}$  14.  $\{-5 \pm \sqrt{29}\}$   
 15.  $\left\{\frac{-3 \pm \sqrt{145}}{4}\right\}$  16.  $\left\{\frac{2 \pm \sqrt{6}}{3}\right\}$  17.  $\left\{\frac{-3 \pm \sqrt{19}}{2}\right\}$  18.  $\{-15, 1\}$  19.  $\left\{-\frac{5}{2}, \frac{2}{3}\right\}$   
 20.  $\{-2, -1\}$

### 9.3 Form I

1.  $\{-5, 3\}$  2.  $\{2, 7\}$  3.  $\left\{-\frac{2}{3}, \frac{1}{2}\right\}$  4.  $\{3 \pm \sqrt{6}\}$  5.  $\{-1 \pm \sqrt{6}\}$  6.  $\{7 \pm \sqrt{19}\}$   
 7.  $\left\{-\frac{9}{4}, -\frac{3}{4}\right\}$  8.  $\left\{-\frac{1}{4}, 6\right\}$  9.  $\left\{-\frac{4}{3}, -\frac{5}{6}\right\}$  10.  $\{2 \pm \sqrt{11}\}$  11.  $\{-3, 0\}$  12. 2015  
 13. 2011 14. 2.4 cm, 4.4 cm 15. 5 sec

### 9.3 Form II

1.  $\{-6, 2\}$  2.  $\left\{\frac{-3 \pm \sqrt{7}}{2}\right\}$  3.  $\left\{\frac{-6 \pm \sqrt{33}}{3}\right\}$  4.  $\{-2 \pm \sqrt{13}\}$  5.  $\left\{\frac{-5 \pm \sqrt{21}}{2}\right\}$   
 6.  $\{4 \pm \sqrt{15}\}$  7.  $\left\{\frac{4 \pm \sqrt{13}}{3}\right\}$  8.  $\{1 \pm \sqrt{5}\}$  9.  $\left\{\frac{3 \pm \sqrt{5}}{2}\right\}$  10.  $\left\{\frac{-3 \pm \sqrt{3}}{2}\right\}$  11.  $\{-5 \pm \sqrt{19}\}$   
 12. 2013 13. 2017 14. 35.6 feet 15. 4.6 sec

### 9.3 Form III

1.  $\{-3, -2\}$  2.  $\{0, 5\}$  3.  $\left\{\frac{3 \pm \sqrt{5}}{4}\right\}$  4.  $\{-3 \pm \sqrt{17}\}$  5.  $\{4 \pm \sqrt{2}\}$  6.  $\left\{-\frac{1}{2}, 3\right\}$   
 7.  $\left\{\frac{-1 \pm \sqrt{113}}{8}\right\}$  8.  $\left\{\frac{-6 \pm \sqrt{26}}{2}\right\}$  9.  $\left\{\frac{-6 \pm \sqrt{6}}{6}\right\}$  10.  $\left\{\frac{-3 \pm \sqrt{7}}{2}\right\}$  11.  $\left\{\frac{-1 \pm \sqrt{17}}{4}\right\}$   
 12. 2014 13. 2014 14. 7 cm 15. 5.2 sec

### 9.4 Form I

1.  $3i$  2.  $8i$  3.  $30i$  4.  $2i\sqrt{5}$  5.  $4i\sqrt{5}$  6.  $10i\sqrt{3}$  7.  $8+11i$  8.  $5-2i$  9.  $7+8i$   
 10.  $-2 \pm 4i$  11.  $-5 \pm 10i$  12.  $6 \pm 8i$  13.  $8 \pm 3i$  14.  $4 \pm i$  15.  $4 \pm 3i$  16.  $-5 \pm 3i$   
 17.  $-1 \pm 3i$  18.  $1 \pm 2i\sqrt{3}$  19.  $2 \pm 5i$  20.  $-2 \pm i\sqrt{3}$

### 9.4 Form II

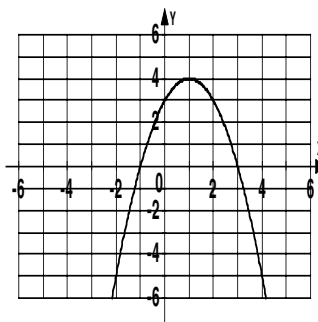
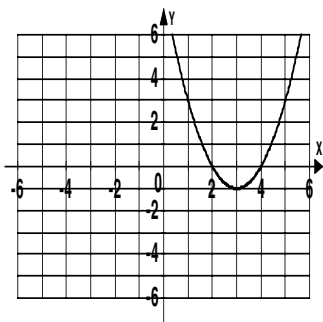
1.  $3i\sqrt{5}$  2.  $6i\sqrt{2}$  3.  $2i\sqrt{11}$  4.  $2i\sqrt{30}$  5.  $10i\sqrt{6}$  6.  $6i\sqrt{15}$  7.  $5+2i\sqrt{2}$  8.  $12-i\sqrt{6}$   
 9.  $11-4i\sqrt{2}$  10.  $15 \pm 2i\sqrt{5}$  11.  $10 \pm i$  12.  $-3 \pm i\sqrt{13}$  13.  $-12 \pm 4i\sqrt{2}$  14.  $11 \pm 5i\sqrt{2}$   
 15.  $\pm 7i$  16.  $1 \pm i$  17.  $2 \pm i$  18.  $\frac{1 \pm i\sqrt{47}}{6}$  19.  $\frac{1 \pm i\sqrt{11}}{4}$  20.  $2 \pm 7i\sqrt{2}$

### 9.4 Form III

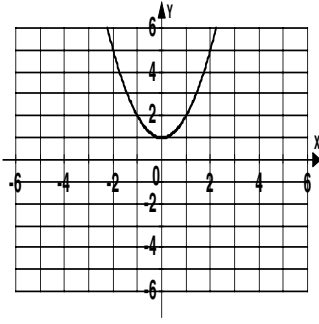
1.  $7i\sqrt{2}$  2.  $5i\sqrt{6}$  3.  $2i\sqrt{70}$  4.  $2i\sqrt{33}$  5.  $9i\sqrt{3}$  6.  $3i\sqrt{30}$  7.  $14+2i\sqrt{7}$   
 8.  $19-5i\sqrt{2}$  9.  $4+7i\sqrt{3}$  10.  $\frac{-3 \pm i\sqrt{6}}{5}$  11.  $\frac{-1 \pm i\sqrt{7}}{2}$  12.  $\frac{2 \pm 2i\sqrt{3}}{3}$  13.  $-5 \pm i\sqrt{11}$   
 14.  $-12 \pm 8i\sqrt{6}$  15.  $\frac{2 \pm i\sqrt{26}}{3}$  16.  $5 \pm i\sqrt{2}$  17.  $\frac{-1 \pm i\sqrt{31}}{2}$  18.  $\frac{7 \pm i\sqrt{23}}{4}$  19.  $\frac{2 \pm i\sqrt{14}}{3}$   
 20.  $\frac{-1 \pm i\sqrt{5}}{2}$

### 9.5 Form I

1. upward 2. downward 3.  $(-4.6, 0)$   $(0.6, 0)$  4.  $(8, 0)$   $(9, 0)$  5.  $(4, 0)$   $(-7, 0)$  6.  $(0, 0)$   
 7.  $(0, 1)$  8.  $(0, -8)$  9.  $(0, 7)$  10.  $(4, -20)$  11.  $(1, 9)$   
 12. 13.



14.



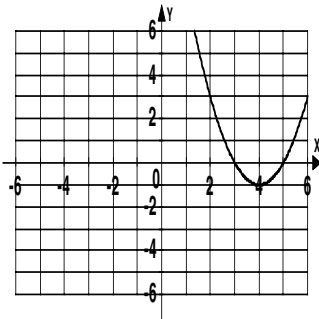
15. 5000 automobiles

### 9.5 Form II

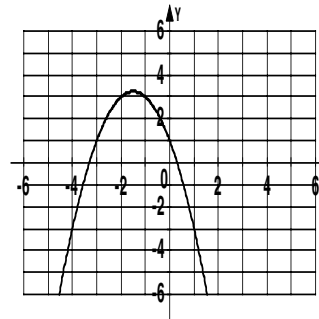
1. downward 2. upward 3. (0, 0) (-18, 0) 4. (3, 0) (-4.5, 0) 5. none 6. (0, 6)

7.  $(0, -\frac{3}{4})$  8. (0, -9) 9.  $(\frac{1}{6}, \frac{1}{12})$  10. (0, 12) 11.  $(-\frac{1}{2}, -\frac{3}{4})$

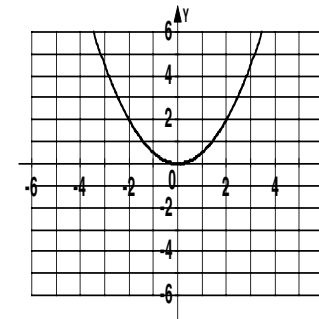
12.



13.



14.



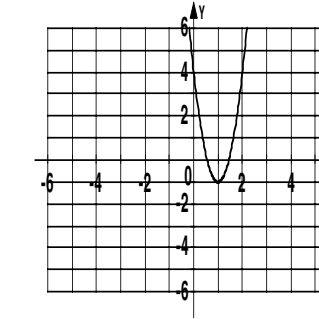
15. 650 ft.

### 9.5 Form III

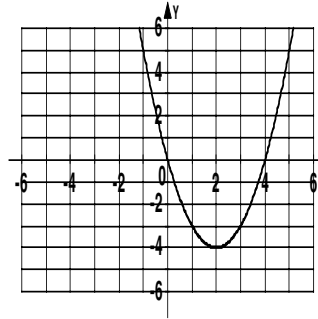
1. upward 2. downward 3. (1.4, 0) (-1.4, 0) 4. (-5.3, 0) (1.3, 0) 5. (4.8, 0) (0.2, 0)

6. (0, 0.15) 7.  $(0, \frac{3}{7})$  8. (0, -24) 9.  $(\frac{3}{2}, -\frac{25}{4})$  10.  $(\frac{7}{2}, \frac{77}{4})$  11. (-1, -1)

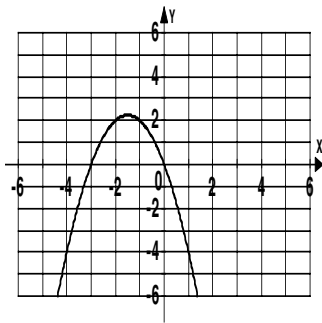
12.



13.



14.



15. 400 pretzels

### 9.6 Form I

- function
- not a function
- function
- not a function
- Domain:  $\{-6, 4, 10\}$  Range:  $\{6, -9, 5\}$
- Domain:  $\{1, -1, 12\}$  Range:  $\{-6, -7, -5\}$
- Domain:  $\{3, -1, 2\}$  Range:  $\{-1, -6, -3\}$
- Domain:  $\{-1, 9, -3\}$  Range:  $\{-2, 4, 7\}$
- 6
- 2
- 1
12. -6
13. 2
14. -1
15. not a function
16. function
17. function
18. \$16.55
19. 511 feet
20. 343.2 oz.

### 9.6 Form II

- function
- not a function
- function
- function
- Domain:  $\{1, 0, -5\}$  Range:  $\{5, 6, -4\}$
- Domain:  $\{-5, 2, 1\}$  Range:  $\{3, -8, 0\}$
- Domain:  $\{1, 2, 3\}$  Range:  $\{1, 2, 3\}$
- Domain:  $\{-8, -6, 0\}$  Range:  $\{5\}$
- 18
- 10
- 10
- 4
12. 0
13. 1
14. 1
15. function
16. function
17. not a function
18. \$18.65
19. 811 feet
20. 181.08 oz.

### 9.6 Form III

- function
- function
- not a function
- function
- Domain:  $\{8, -3, 5\}$  Range:  $\{1, 6, 0\}$
- Domain:  $\{-4, 7, 8\}$  Range:  $\{2, -1, -9\}$
- Domain:  $\{5, -2, 6\}$  Range:  $\{5, -2, 6\}$
- Domain:  $\{9, 5, 0\}$  Range:  $\{3, -4, 1\}$
- 26
- 40
11. 10
12. 14
13. 3
14. 1
15. function
16. not a function
17. not a function
18. \$28.10
19. 1323 feet
20. 222 feet