

Transition to College Mathematics

Answers to odd-numbered exercises

Exercise Set 1.1

- | | | |
|---------|---------|---------|
| 1. -6 | 3. 23 | 5. 5 |
| 7. 20 | 9. 75 | 11. 75 |
| 13. -1 | 15. 3 | 17. 3 |
| 19. -6 | 21. 81 | 23. 125 |
| 25. 16 | 27. -72 | 29. 25 |
| 31. -8 | 33. 5 | 35. -16 |
| 37. 54 | 39. 5 | 41. 75 |
| 43. 225 | 45. 34 | 47. -9 |
| 49. 10 | 51. -9 | 53. 16 |
| 55. 18 | 57. -8 | |

Exercise Set 1.2

- | | | |
|--|---|---|
| 1. $5 \cdot 7$ | 3. $2^3 \cdot 11$ | 5. $2 \cdot 37$ |
| 7. $2^2 \cdot 17$ | 9. $2^4 \cdot 7$ | 11. $2^2 \cdot 3^3 \cdot 17$ |
| 13. $GCF : 2 \cdot 3^2, LCM : 2^4 \cdot 3^4$ | 15. $GCF : 3 \cdot 7, LCM : 3^2 \cdot 5 \cdot 7^2 \cdot 13$ | 17. $GCF : 2^2 \cdot 5^2, LCM : 2^4 \cdot 5^3 \cdot 17$ |
| 19. $GCF : 3, LCM : 36$ | 21. $GCF : 2, LCM : 72$ | 23. $GCF : 3, LCM : 30$ |
| 25. $GFC : 10, LCM : 300$ | 27. $GCF : 15, LCM : 225$ | 29. $GCF : ab^3, LCM : a^2b^7$ |
| 31. $GCF : a^2b, LCM : a^7b^5c^3$ | 33. $GCF : 3x^3, LCM : 30x^7$ | 35. $GCF : a^2b^2, LCM : 120a^4b^7$ |
| 37. $GCF : 3w, LCM : 459x^2w^5$ | 39. $GCF : 4ab^2, LCM : 208a^2b^5$ | 41. $GCF : 4xy, LCM : 120x^4y^3w^5$ |
| 43. $GCF : 6c^2, LCM : 504b^4c^6d^7$ | | |

Exercise Set 1.3

- | | | |
|---------------------------------------|----------------------------------|----------------------------------|
| 1. $\frac{2}{5}$ | 3. $\frac{2}{3}$ | 5. $\frac{2}{3^2 \cdot 5}$ |
| 7. $\frac{3^2 \cdot 5}{2^4 \cdot 7}$ | 9. $\frac{a^4}{b^7}$ | 11. $\frac{2y}{7x^2}$ |
| 13. $\frac{31}{4}$ | 15. $\frac{17}{3}$ | 17. $3\frac{3}{4}$ |
| 19. $4\frac{4}{9}$ | 21. $\frac{17}{12}, LCD : 12$ | 23. $-\frac{4}{3}, LCD : 6$ |
| 25. $\frac{11}{4}, LCD : 2^2 \cdot 3$ | 27. $\frac{3}{100}, LCD : 100$ | 29. $\frac{2a+3b}{ab}, LCD : ab$ |
| 31. $\frac{3+a}{6a^2}, LCD : 6a^2$ | 33. $\frac{5a+2b}{10}, LCD : 10$ | 35. $\frac{5x-7y}{35}, LCD : 35$ |
| 37. $\frac{37}{30}$ | 39. $\frac{17}{24}$ | 41. $5\frac{1}{5}$ |

43. $\frac{13}{5}$

49. $\frac{4}{9}$

55. $-\frac{5}{4}$

61. $-\frac{1}{18}$

67. $\frac{7}{12}$

45. $\frac{2}{5}$

51. $\frac{4}{9}$

57. $-\frac{4}{7}$

63. $\frac{41}{25}$

69. $-\frac{27}{8}$

47. $\frac{26}{5}$

53. $\frac{13}{5}$

59. $-\frac{27}{64}$

65. 2

71. -7

Exercise Set 1.4

1. 2.8, 2.76, 2.764

3. 37.5, 37.47, 37.469

5. $\frac{14}{5}$

7. $\frac{38}{25}$

9. 0.375

11. $0.8\bar{3}$

13. 5%

15. 140%

17. 0.05

19. 0.0045

21. 400

23. 40.3125

25. 8.75%

27. 1500

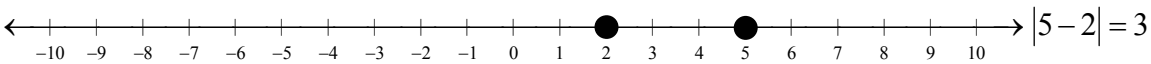
Exercise Set 1.5

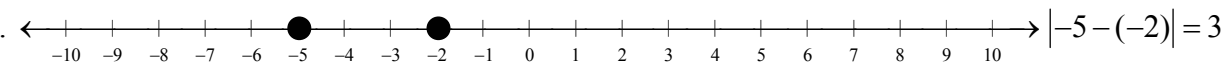
1. 7

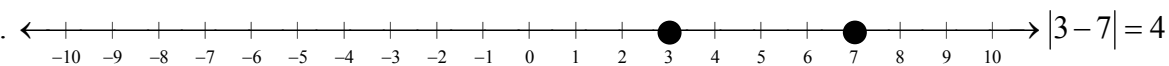
3. -3

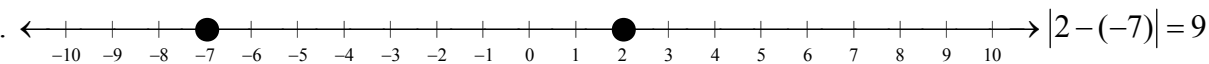
5. 7

7. 6

9.  $|5 - 2| = 3$

11.  $|-5 - (-2)| = 3$

13.  $|3 - 7| = 4$

15.  $|2 - (-7)| = 9$

17. $\frac{2}{5} = \frac{16}{40}, \frac{3}{8} = \frac{15}{40}, \frac{2}{5} > \frac{3}{8}$

19. $-\frac{5}{6} = -\frac{10}{12}, -\frac{3}{4} = -\frac{9}{12}, -\frac{3}{4} > -\frac{5}{6}$

21. $\frac{3}{15} = \frac{6}{30}, \frac{1}{6} = \frac{5}{30}, \frac{3}{15} > \frac{1}{6}$

23. $-\frac{17}{6} = -\frac{51}{18}, -\frac{49}{18} > -\frac{17}{6}$

25. $\frac{1}{3} > 0.33$

27. $3\frac{4}{5} > \frac{12}{5}$

29. $-1\frac{5}{16} < -\frac{5}{4}$

31. $4.375 > 4.357$

33. $-\frac{2}{3} < -0.666$

35. $0.0357 > 0.00753$

37. $\frac{7}{36}$

Exercise Set 1.6

1. 6.5%

7. (a) 12,568.5 (b) $0.9975x$

13. \$1,000

19. (a) \$560 (b) $140x$

25. (a) 27.1 (b) 221 lbs.

31. 4.5 ft./sec.

37. 62.5 cm.

43. 7.2 gal.

3. 25.93%

9. $0.75x$, $0.795x$ 15. $\frac{35}{54}x$ 21. (a) \$160 (b) $25n-15$

27. 18 min. 59 sec.

33. 49.7 m.p.h.

39. 200,000 cm.

5. (a) \$79.35 (b) $1.058x$ 11. (a) \$96,750 (b) $2.15x$ 17. (a) \$638 (b) $A = 9h + 0.05S$

23. 7.8 miles

29. 5.11 g.

35. 5 min.

41. 139 in.

Exercise Set 2.1

1. $9,600 \text{ cm}^2$

3. 9 feet

5. 48 feet

7. (a) 36 cm (b) $4n + 8 \text{ cm}$

9. (a) 42 feet (b) $6n + 6 \text{ feet}$

11. (a) 12.25 m^2 (b) $\frac{1}{4}b^2 \text{ m}^2$

13. (a) 13.7 cm^2 (b) $s^2 - \frac{1}{4}\pi s^2 \text{ cm}^2$

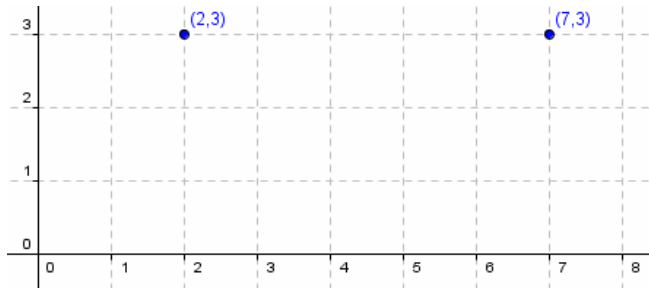
15. (a) 46 m^2 (b) 42 m (c) \$552

17. (a) $12 + \frac{9}{8}\pi \text{ ft}^2$ (b) $11 + 2\pi \text{ ft}$

19. (a) $x^2 + 15x$ (b) $4x + 30$

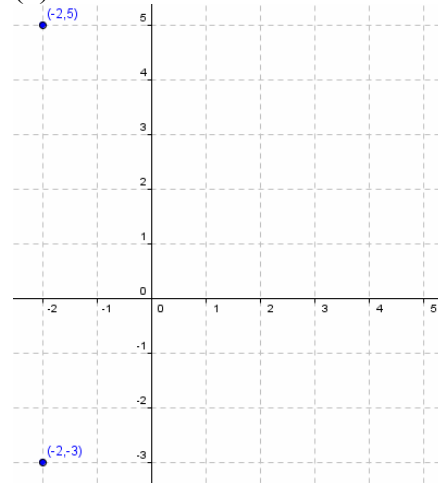
Exercise Set 2.2

1. (a)



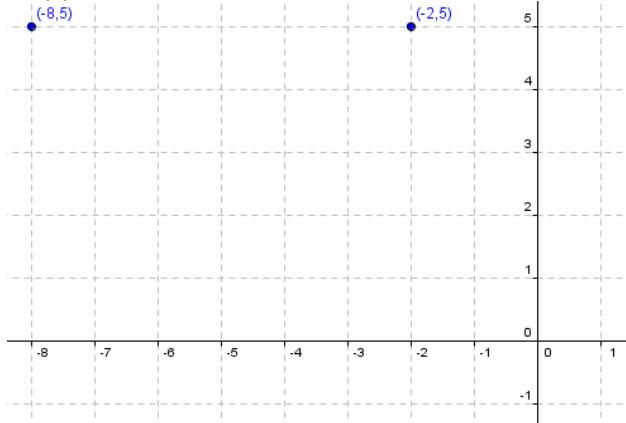
distance: 5

(b)



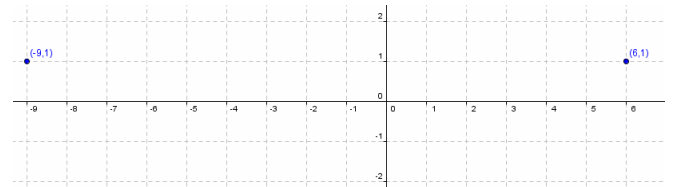
distance: 8

(c)



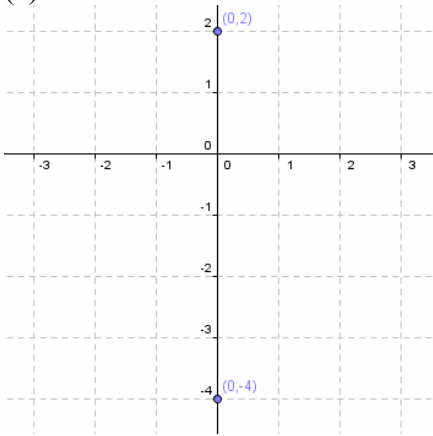
distance: 6

(d)



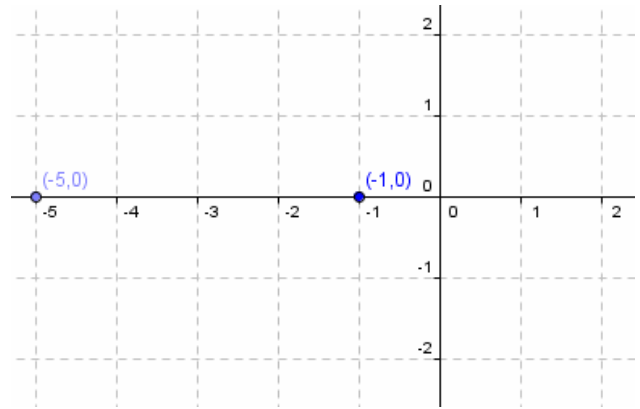
distance: 15

(e)



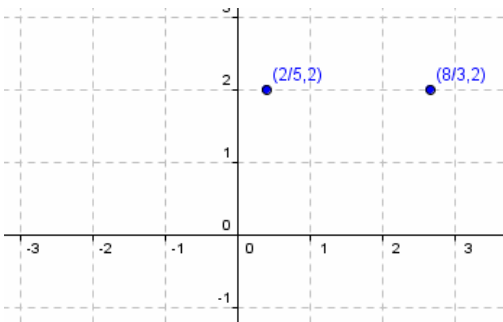
distance: 6

(f)



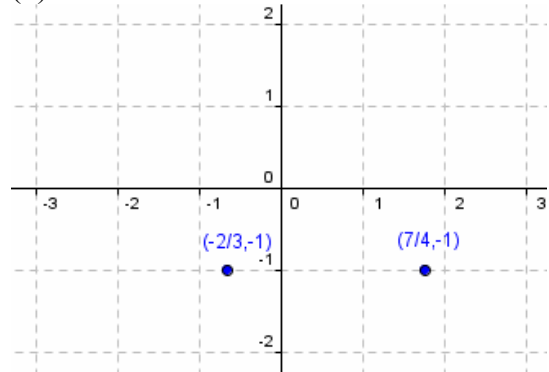
distance: 4

(g)



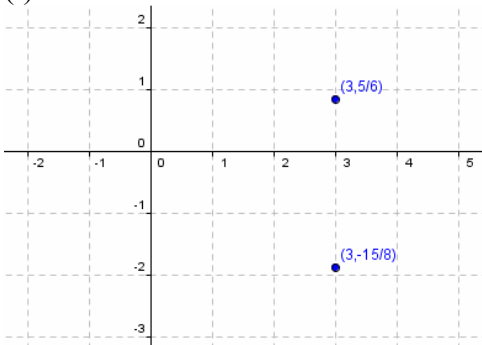
distance: $\frac{34}{15}$

(h)



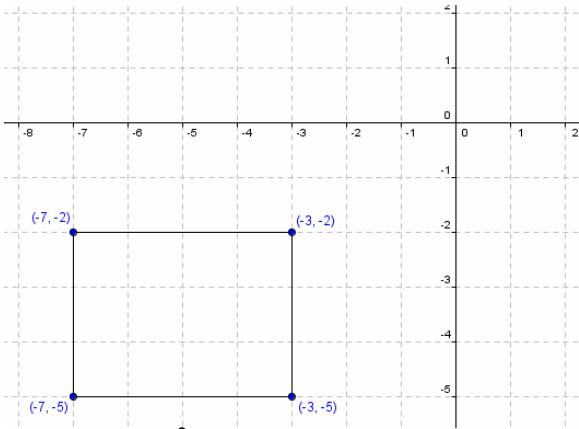
distance: $\frac{29}{12}$

(i)



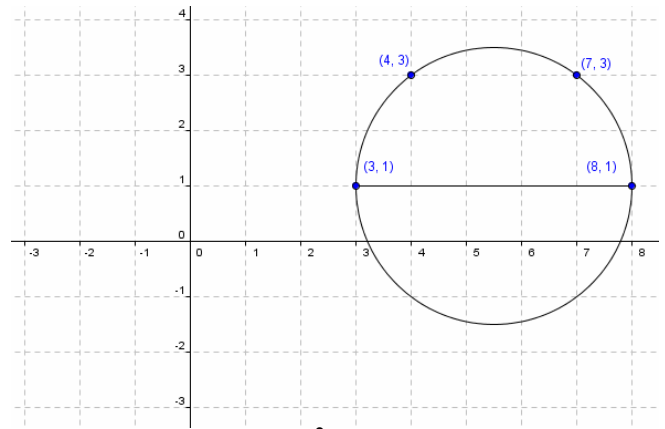
distance: $\frac{65}{24}$

3.



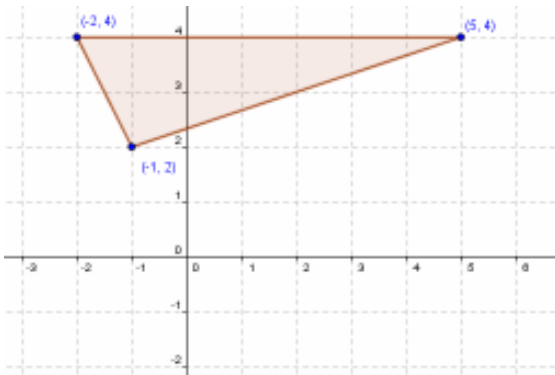
Area: 12 units^2 , Perimeter: 14 units

5.



Area: $6.25\pi \approx 19.6 \text{ units}^2$, Perimeter: $5\pi \approx 15.7 \text{ units}$

7.



Area: 7 units^2

9. (a) $P(-2, -2), Q(5, -2)$ (b) $P(-2, -1), Q(5, -1)$

Exercise Set 2.3

1. 2.4 feet

7. 1050 feet

13. 4.7 feet

3. $5\sqrt{2} \approx 7.1 \text{ in}$

9. \$305.47

5. 24 feet

11. 32.5 miles

Exercise Set 3.1

1. $-8x^{12}$

7. $\frac{y^2 z^9}{x^5}$

13. $\frac{1}{8x^9}$

19. $\frac{-64x^6}{y^{21}}$

25. $\frac{1}{9y^6}$

31. $\frac{3c^7}{4a^3}$

37. $\frac{1}{5}$

43. -32

3. $9a^8 b^2 c^{10}$

9. $\frac{12}{a^2}$

15. $\frac{1}{u^6}$

21. $\frac{-8a^9}{b^{12} c^{21}}$

27. $\frac{x^{22}}{4}$

33. $\frac{9y^7}{2x}$

39. $\frac{1}{8}$

45. 63

5. $49a^8$

11. $\frac{v^4}{16u^4}$

17. $\frac{y^{12}}{x^8}$

23. $\frac{1}{25a^2 b^8}$

29. $\frac{z^3}{x^7 y^6}$

35. $\frac{1}{64}$

41. $\frac{9}{4}$

Exercise Set 3.2

1. $2x^3 \sqrt{3}$

7. $2x^2 y^8 \sqrt{xy}$

13. $6x^2 y^4 \sqrt{2xy}$

19. $x^2 y^2 \sqrt{\frac{x}{5}}$

25. 384

3. $9x^4 \sqrt{x}$

9. $\frac{2\sqrt{5}}{x^{10}}$

15. $\frac{3y^4}{2z} \sqrt{\frac{3}{2z}}$

21. $12\sqrt{3}$

5. $2z^3 \sqrt{6z}$

11. $\frac{4x\sqrt{2x}}{3y}$

17. $3x^3 \sqrt{x}$

23. $98\sqrt{77}$

Exercise Set 3.3

1. $2x^3 \sqrt[3]{x^2}$

7. $\frac{3x^6 \sqrt[3]{2}}{y^9}$

13. $\sqrt[3]{x^2}$

19. 2

25. 2

31. $4\sqrt{2}$

3. $2x^2 y^3 \sqrt[3]{5y^2}$

9. $\frac{1}{3^{1/2}}$

15. $\sqrt[5]{x^3}$

21. -3

27. -2

33. $\frac{64}{27}$

5. $\frac{2\sqrt[3]{6}}{y^4}$

11. $5^{3/2}$

17. $\frac{2}{3}$

23. $-\frac{1}{2}$

29. 4

35. 243

$$37. \frac{1}{5}$$

Exercise Set 4.1

1. $-3x+2$

7. $6x^3-22x$

13. $5x^2+7x-4$

19. $\frac{25}{12}x$

3. $7x^2-12x-4$

9. $x^2+8x+29$

15. $\frac{4}{5}x$

21. $\frac{19x}{12}$

5. $-x^3+2x^2+3x-1$

11. x^4-3x^3+4x+2

17. $\frac{5}{4}t$

23. $\frac{3}{5}x^2-\frac{7}{8}x-\frac{1}{12}$

Exercise Set 4.2

1. $3x^6-6x^5-3x^3+15x^2$

7. $6x^2+32x+10$

13. $x^4-4x^2y^3+4y^6$

19. $x^3+6x^2+12x+8$

25. $8x^3-12x^2+6x-1$

3. $2a^8-6a^7b-8a^5b^3$

9. $5y^2-19y+12$

15. $1-6x+9x^2$

21. $x^6+4x^3y^5+4y^{10}$

5. $15t^2+2t-8$

11. $9x^2-12x+4$

17. y^3-y^2-2y+8

23. x^3+3x^2+3x+1

Exercise Set 4.3

1. $4x(x^2+2)$

7. $15t^3(3t^2-2)$

13. $3ab(3a+2b^2+5a^3b)$

19. $(x+3)(x-1)$

25. $(x-7y)(x-y)$

31. $(t+8)(t-5)$

37. $(6x+1)(x-2)$

43. $(5x-8)(x-3)$

49. $(3t-2)(t+5)$

55. $(2x-3)(3x+4)$

61. $(2x-3y)(x+2y)$

67. $(x-5)(x-3)$

73. $a^2b^3(a+b)(a-b)$

79. $x^4y^2(x+3y)(x-3y)$

85. $(x^2+2)(x^2+3)$

91. $(3x^2+7)(3x^2-7)$

3. $8x^3(3-x^2)$

9. $2y(x+1)(3y+4)$

15. $4(2x^2-5x+8)$

21. $(x-3)(x+2)$

27. $(a+4b)(a-3b)$

33. $(y+6)(y-4)$

39. $(4x-3)(2x-5)$

45. $(2x-1)(x+3)$

51. $(2x-3)(2x+1)$

57. $(2b+3)(3b-1)$

63. $(2a-b)(3a-2b)$

69. $3(x+3)(x-3)$

75. $3x(2x+1)(x+7)$

81. $(2x-3y)(3x+4y)$

87. $(x^2+y^2)(x+y)(x-y)$

93. $(x-3)(x+2)(x-2)$

5. $a^2b(3-7ab^3)$

11. $(a-1)(4a-7)$

17. $3(x+2)(8x^2+10x+5)$

23. $(x-8)(x+3)$

29. $(3s+4t)(3s-4t)$

35. $(2x-1)(x+3)$

41. $(6x-1)(2x+3)$

47. $(3a+5)(a+1)$

53. $(3a-8)(3a+2)$

59. $(3x+2)(5x+2)$

65. $6x(2x^2+3)$

71. $5x^2(2x-1)(x-3)$

77. $xy^2(2x+3)(x+5)$

83. $5ab^2(x-3)(x+1)$

89. $(x-2)(x+5)(2x+3)$

95. $5(x^2+4y^2)(x+2y)(x-2y)$

Exercise Set 5.1

1. $9a^3b, \frac{5b^3}{a^2}$

3. $x(x-1), \frac{3(x-1)}{5x}$

5. $x^2(x+3), \frac{(x+3)^2}{x^5(2x-1)}$

7. $\frac{3y^3}{4x^4z}$

9. $\frac{-4}{7}$

11. $\frac{x+3}{1+2x^2}$

13. $\frac{1+b^2}{1+a^2}$

15. $\frac{x^2+y^2+z^2}{xyz}$

17. $t-1$

19. $x-2$

21. $\frac{x+2}{x+1}$

23. $\frac{x-1}{x-2}$

25. $\frac{x+1}{3(x+2)}$

27. $\frac{y-4}{y+2}$

29. $\frac{x+y}{3x-y}$

31. $\frac{3}{2x-1}$

33. $\frac{x+2}{3(x-2)}$

35. $\frac{(t+3)(t-6)}{(2t+3)(t+1)}$

Exercise Set 5.2

1. $\frac{x^5}{2y^3}$

3. 6

5. $\frac{y}{x^2}$

7. $-(x+3)$

9. $\frac{x}{4(x-3)}$

11. $\frac{x+2}{x-1}$

13. $\frac{x+y}{5x}$

15. $x(x+2)$

17. $\frac{2a+3b}{a+b}$

Exercise Set 5.3

1. x^4y^7z

3. $36(x-1)^3$

5. $(x+3)(x+2)^2$

7. $(x+3)(x+5)(x-5)$

9. $\frac{21}{6x^2}, \frac{10}{6x^2}$

11. $\frac{3x^3}{36x^5y^3}, \frac{2y^2}{36x^5y^3}$

13. $\frac{3(x-1)}{x(x-1)^2}, \frac{7x}{x(x-1)^2}$

15. $\frac{x(x+2)}{(x+1)(x+2)(x+3)}, \frac{(x+5)(x+3)}{(x+1)(x+2)(x+3)}$

17. $\frac{y-4}{7x^2}, 7x^2$

19. $\frac{11x}{12}, 12$

21. $\frac{t+s}{st}, st$

23. $\frac{3c-4}{c^4}, c^4$

25. $\frac{2(4x+3)}{x(x+2)}, x(x+2)$

27. $\frac{5x-6}{x-2}, x-2$

29. $\frac{6st+4rt+3rs}{12rst}, 12rst$

31. $\frac{x(x+6)}{x+7}, x+7$

33. $\frac{a^2+a+1}{a^3}, a^3$

35. $\frac{1}{5-x}, 5-x$

37. $\frac{x-9}{(x-2)(x-3)(x+5)}, (x-2)(x-3)(x+5)$

$$39. \frac{x^2 + x + 4}{(x+1)^2(x-1)}, (x+1)^2(x-1)$$

Exercise Set 6.1

1. $x = 6$

7. $x = -12$

13. $x = \frac{10}{7}$

19. $x = -3\pi$

25. $x = 200$

31. $x = \frac{11}{3}$

37. $\frac{84}{\pi} \approx 26.7$ in.

3. $x = \frac{14}{3}$

9. $x = 3$

15. $x = 60$

21. $x = -7$

27. $x = 27$

33. $x = \frac{30}{11}$

39. (a) 59° F (b) 14° F

5. $x = 9$

11. $x = 0$

17. $x = \frac{35}{3}$

23. $x = -\frac{2}{17}$

29. $x = \frac{20}{3}$

35. 27 in.

Exercise Set 6.2

1. $y = -\frac{2}{3}x + 2$

7. $F = \frac{5}{3}L - 15$

13. $x = a + \frac{5}{3}y - \frac{5}{3}b$

19. $x = a - 3 - \frac{ay}{b} - \frac{a}{b}$

25. $C = \frac{5}{9}F - \frac{160}{9}$

3. $y = -\frac{a}{b}x + \frac{c}{b}$

9. $x = \frac{c}{a^2 - b}$

15. $T = \frac{9}{4}R + 12$

21. $w = \frac{P - 2l}{2}$

27. $W = \frac{7}{4}L - \frac{7}{4}L_0$

5. $a = \frac{6}{b}$

11. $y = \frac{a - 3b}{d - c}$

17. $x = -\frac{8}{9}y + \frac{20}{3}$

23. $r = \frac{C}{2\pi}$

29. $h = \frac{3V}{L^2}$

Exercise Set 6.3

1. $A = x^2 + 2x, P = 4x + 4$

7. $h = \frac{2A}{b}$ cm.

13. $3xh - 10x$ dollars

19. (a) $4x + 3$ (b) $50x + 15$ cents

25. Votto: 29, Bruce: 32

31. 5,000

37. \$1: 15, \$5: 3, \$10: 6, \$20: 6

43. M: \$52,500; C: \$63,000; L: \$68,250

47. 10 pounds

3. $A = 2x^2 + 3x, P = 6x + 6$

9. (a) $S = 3x + 6$ (b) $S = 3x$

15. (a) $0.035x$ (b) $1.035x$

21. $0.35x + 0.75y$ pounds

27. 94

33. 9

39. R: 3 ft/sec, J: 5 ft/sec

45. 25 mL.

49. C: 22 hrs., A: 27 hrs.

5. $w = \frac{P - 2l}{2}$

11. 0.07x

17. (a) $3x$ (b) $0.16x$

23. P: \$405,000, VP: \$225,000

29. 315 ft^2

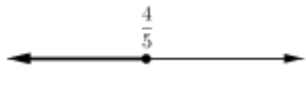
35. \$2,250 and \$4,750

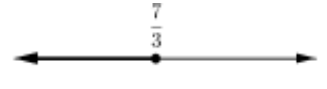
41. 4.2 miles

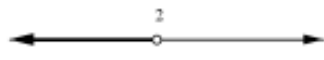
Exercise Set 6.4

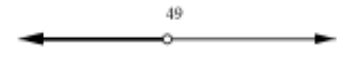
1. $x \geq 6$ $[6, \infty)$ 

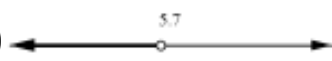
3. $x > \frac{19}{4}$ $\left(\frac{19}{4}, \infty\right)$ 

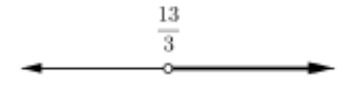
5. $x \leq \frac{4}{5}$ $\left(-\infty, \frac{4}{5}\right]$ 

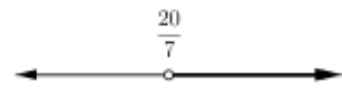
7. $x \leq \frac{7}{3}$ $\left(-\infty, \frac{7}{3}\right]$ 

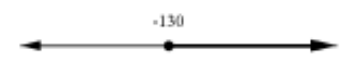
9. $x < 2$ $(-\infty, 2)$ 

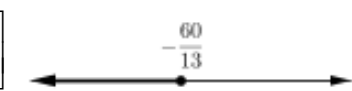
11. $x < 49$ $(-\infty, 49)$ 

13. $x < 5.7$ $(-\infty, 5.7)$ 

15. $x > \frac{13}{3}$ $\left(\frac{13}{3}, \infty\right)$ 

17. $x > \frac{20}{7}$ $\left(\frac{20}{7}, \infty\right)$ 

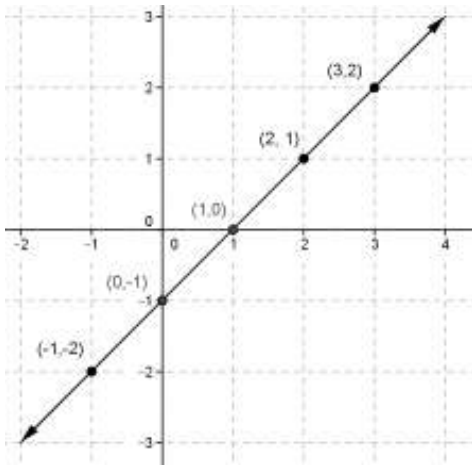
19. $x \geq -130$ $[-130, \infty)$ 

21. $x \leq \frac{60}{13}$ $\left(-\infty, \frac{60}{13}\right]$ 

Exercise Set 7.1

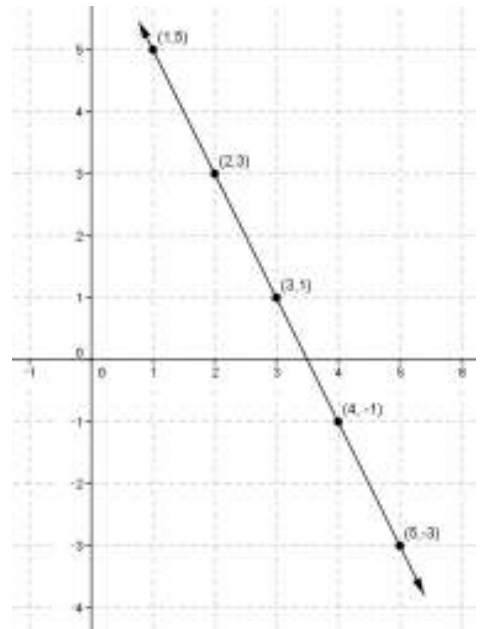
1.

x	y
2	1
3	2
1	0
0	-1
-1	-2



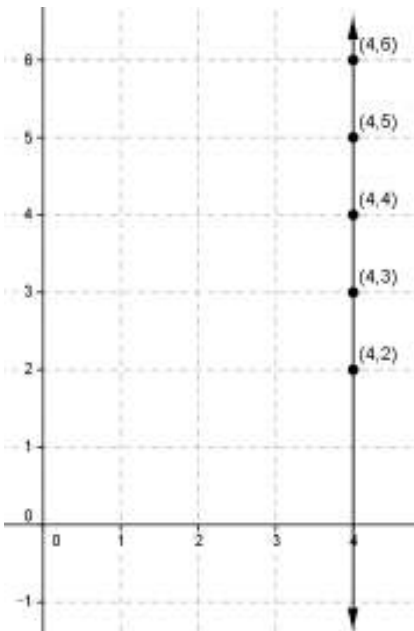
3.

x	y
4	-1
1	5
2	3
3	1
5	-3



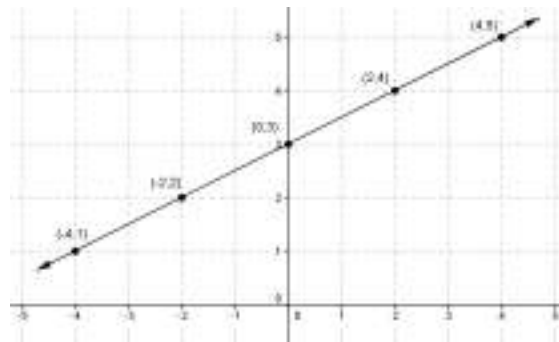
5.

x	y
4	5
4	6
4	4
4	3
4	2



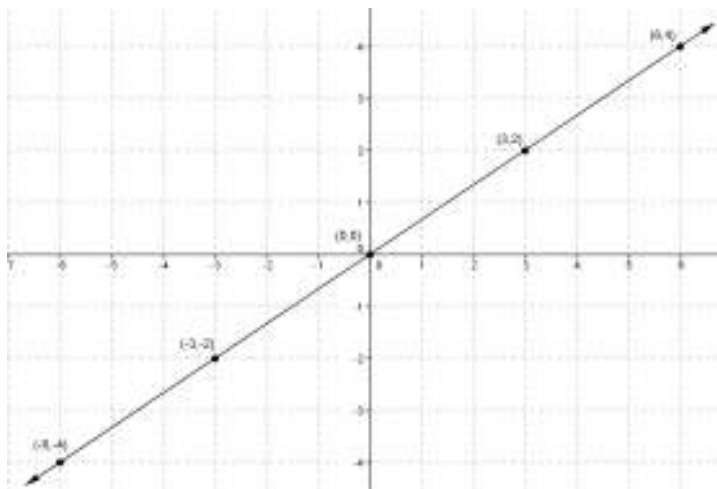
7.

x	y
2	4
4	5
0	3
-2	2
-4	1



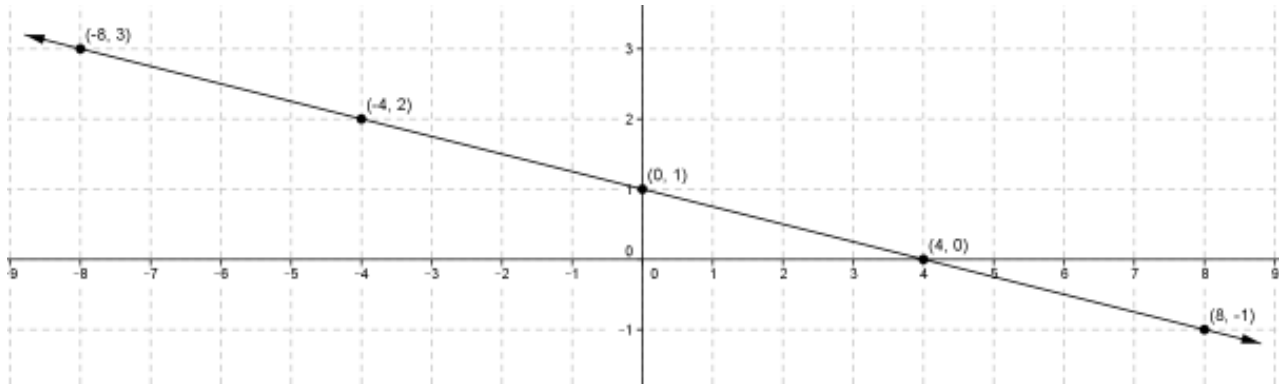
9.

x	y
0	0
3	2
6	4
-3	-2
-6	-4

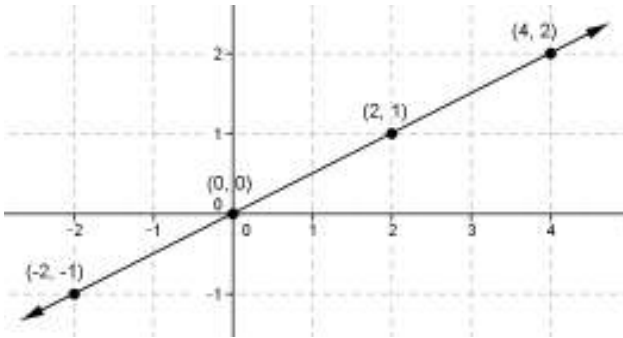


11.

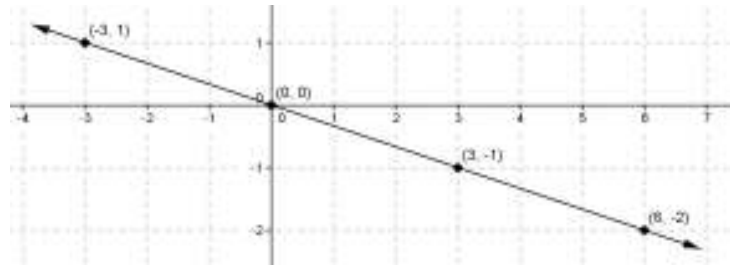
x	y
0	1
-8	3
-4	2
4	0
8	-1



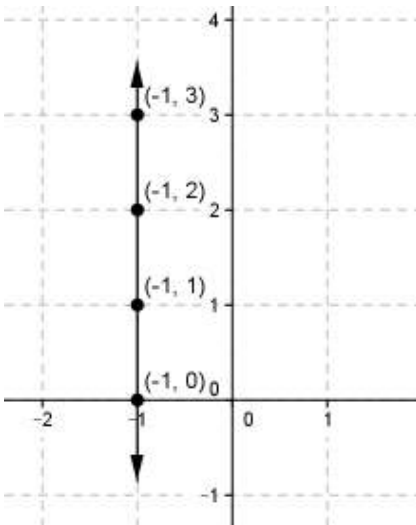
13. Slope: $\frac{1}{2}$



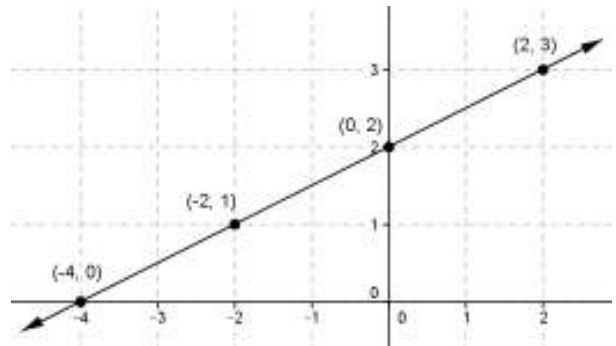
15. Slope: $-\frac{1}{3}$



17. No Slope



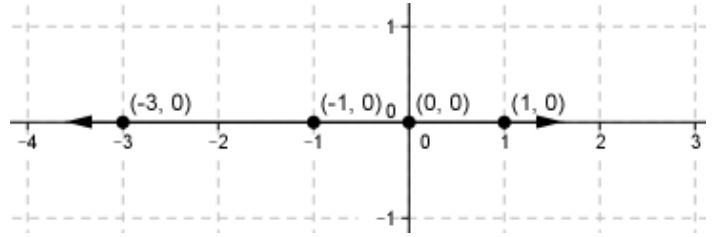
19. Slope: $\frac{1}{2}$



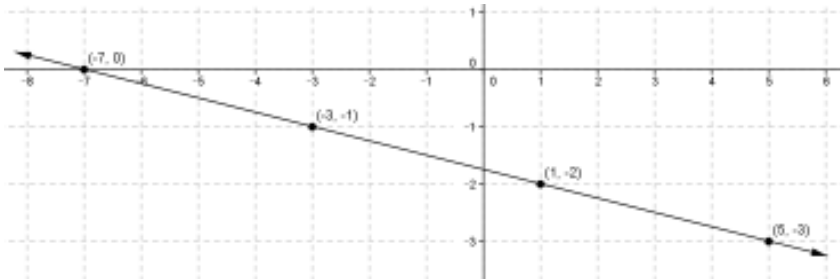
21. No Slope



23. Slope: 0



25. Slope: $-\frac{1}{4}$



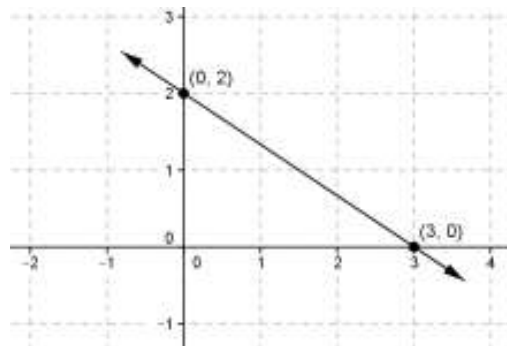
27. $\frac{3}{2}$

29. $\frac{1}{2}$

31. -3

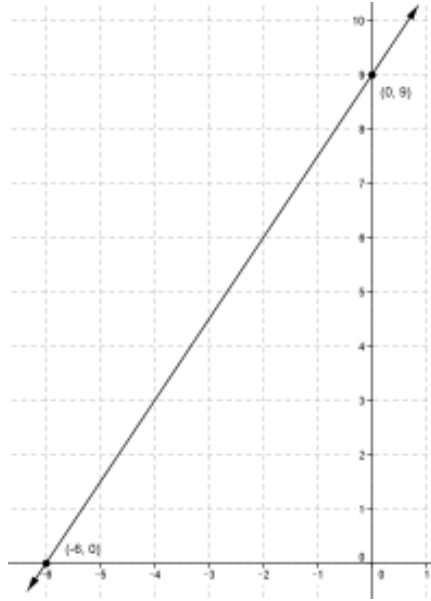
Exercise Set 7.2

1. x-intercept: 3, y-intercept: 2



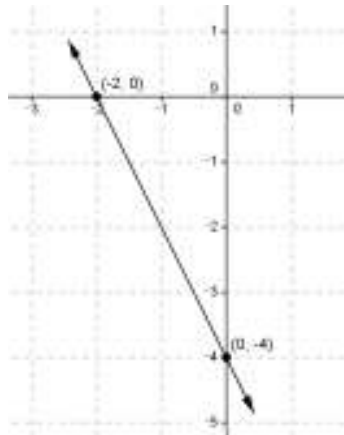
Slope: $-\frac{2}{3}$, $y = -\frac{2}{3}x + 2$

3. x-intercept: -6, y-intercept: 9



Slope: $\frac{3}{2}$, $y = \frac{3}{2}x + 9$

5. x-intercept: -2, y-intercept: -4

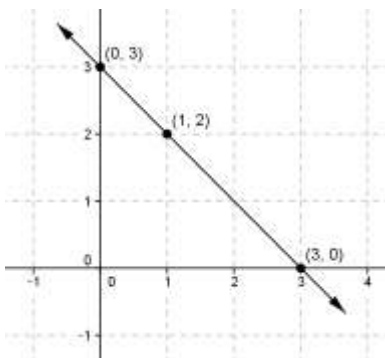


Slope: -2, $y = -2x - 4$

7. $y = -x$

13. $y = 2x + 6$

17.

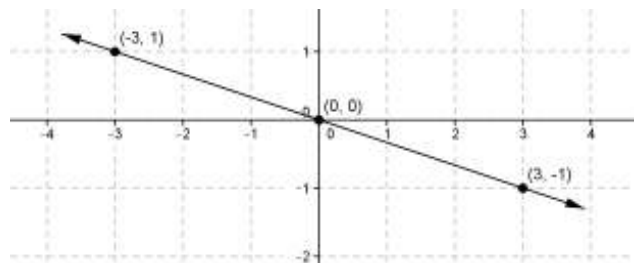


9. $y = -\frac{8}{5}x - \frac{1}{5}$

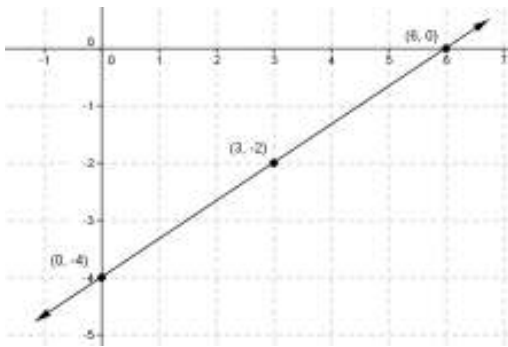
15. $y = 4x + 4$

11. $y = \frac{2}{5}x - \frac{8}{5}$

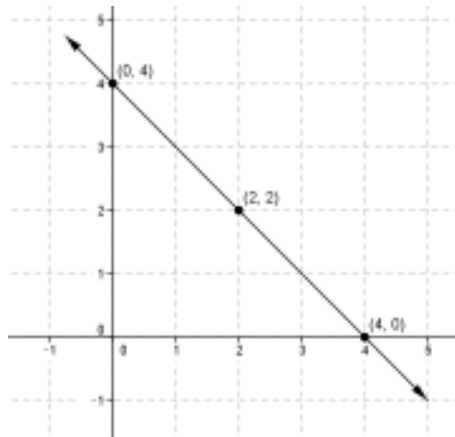
19.



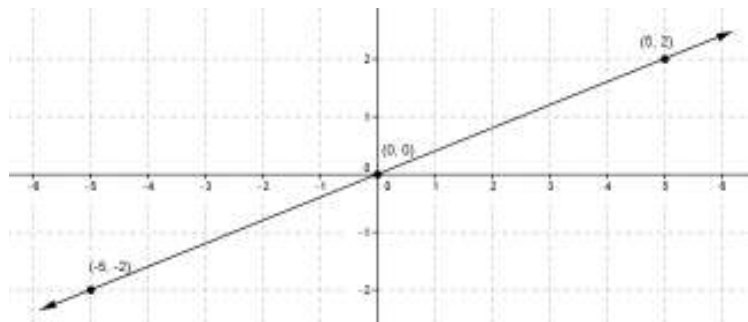
21.



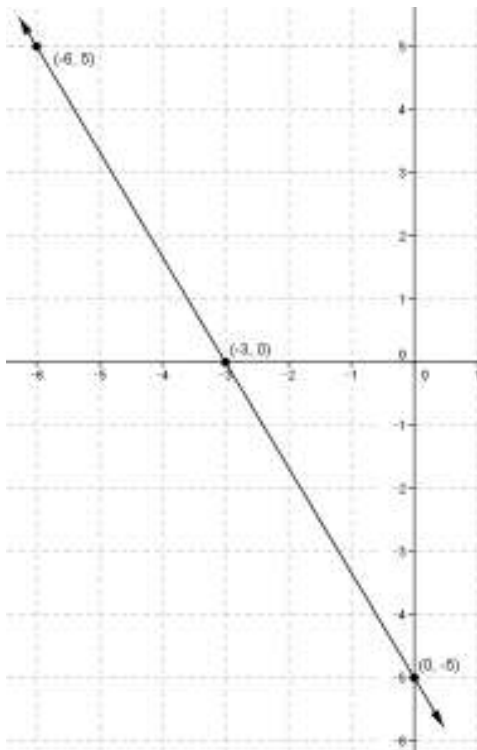
23. Slope: -1, x-intercept: 4, y-intercept: 4



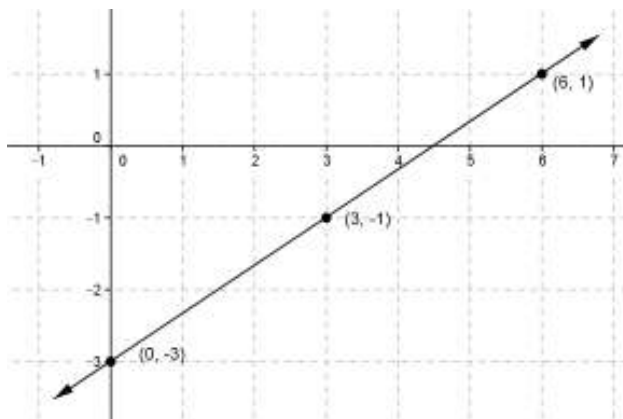
25. Slope: $\frac{2}{5}$, x-intercept: 0, y-intercept: 0



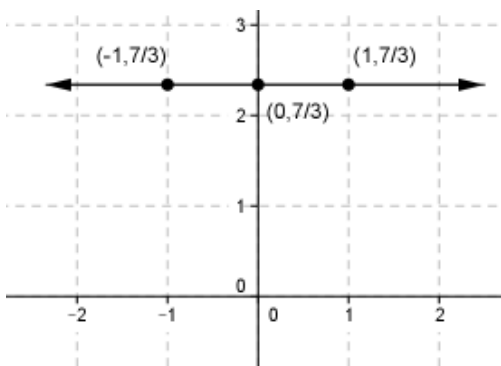
27. Slope: $-\frac{5}{3}$, x-intercept: -3, y-intercept: -5



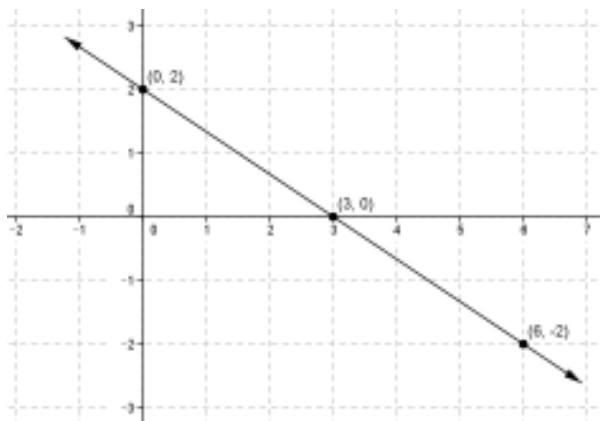
29. Slope: $\frac{2}{3}$, x-intercept: $\frac{9}{2}$, y-intercept: -3



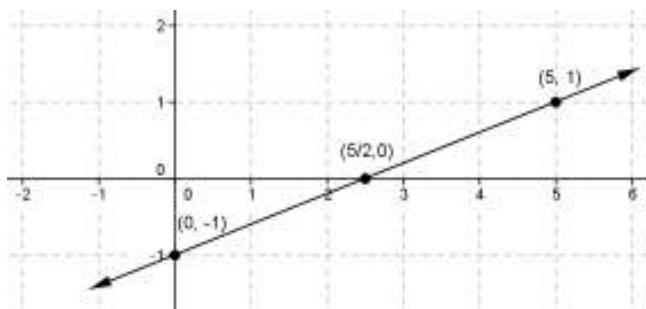
31. Slope: 0, x-intercept: none, y-intercept: $\frac{7}{3}$



33. Slope: $-\frac{2}{3}$, x-intercept: 3, y-intercept: 2



35. Slope: $\frac{2}{5}$, x-intercept: $\frac{5}{2}$, y-intercept: -1



37. $-\frac{2}{3}$

39. $\frac{5}{4}$

41. 6

43. 5

45. $-\frac{7}{3}$

47. $\frac{6}{5}$

49. $y = x + 3$

51. $y = -\frac{1}{2}x + 3$

53. $y = \frac{2}{3}x - \frac{14}{3}$

55. $y = \frac{3}{4}x - \frac{5}{2}$

Exercise Set 7.3

1. parallel

3. perpendicular

5. neither

7. parallel

9. $y = 3x + 7$

11. $x = -2$

13. $y = -\frac{2}{3}x - \frac{10}{3}$

15. $y = -\frac{3}{5}x + \frac{13}{5}$

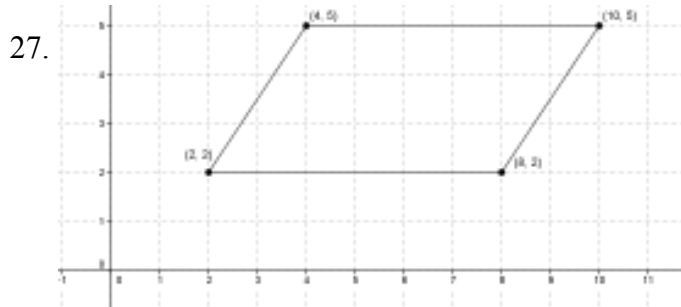
17. $x = -4$

19. $y = -\frac{3}{5}x - \frac{18}{5}$

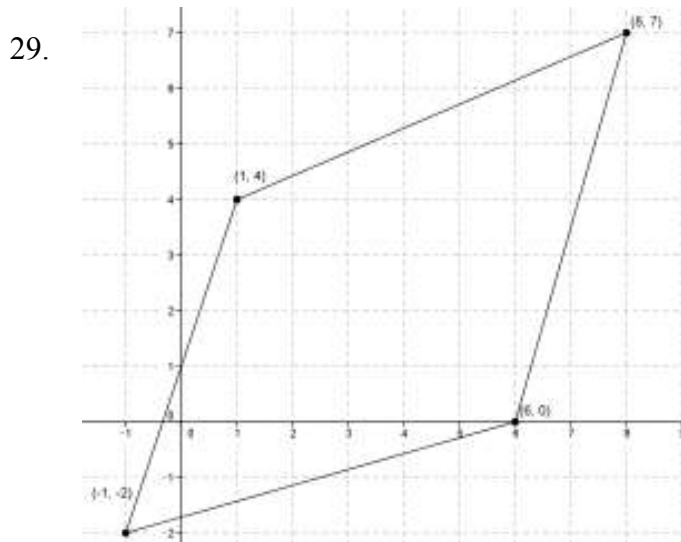
21. $y = -\frac{4}{5}x + 8$

23. $x = -3$

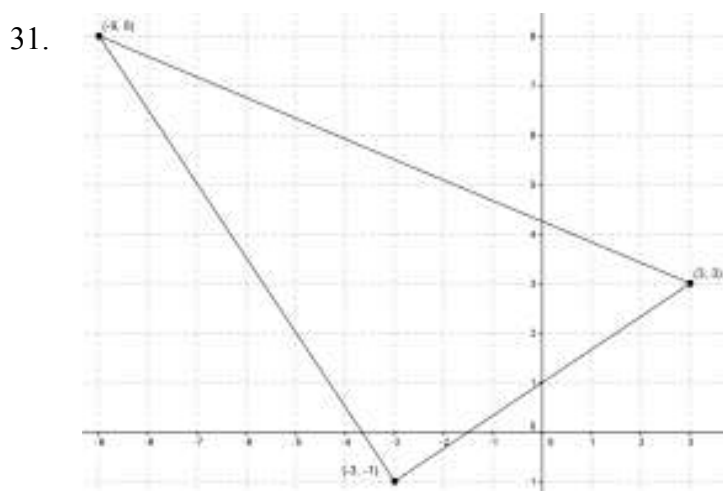
25. $y = \frac{4}{5}x + 3$



Slopes: 0 and $\frac{3}{2}$, parallelogram

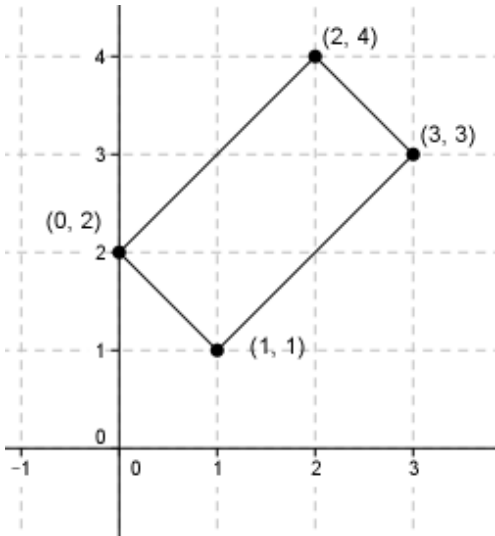


Slopes: $\frac{2}{7}$, $\frac{7}{2}$, $\frac{3}{7}$, and 3, not a parallelogram



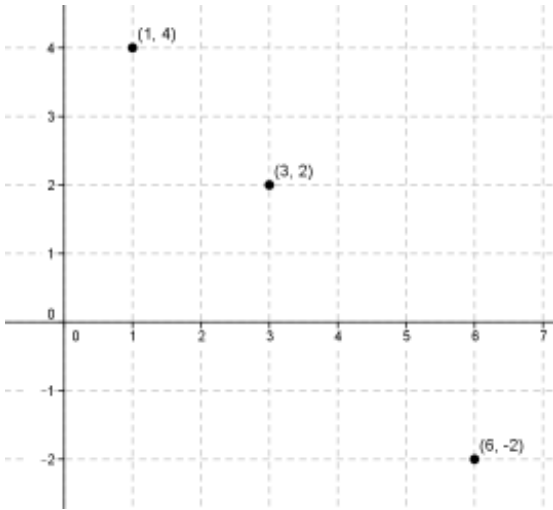
Slopes: $\frac{2}{3}$, $-\frac{5}{12}$, and $-\frac{3}{2}$, right triangle

33.



Slopes: 1 and -1, rectangle

35.



Slopes: -1, $-\frac{4}{3}$, and $-\frac{6}{5}$, not collinear

Exercise Set 8.1

1. $x = 2$ or $x = 3$

5. $x = 2$ or $x = -7$

9. $D > 0$, $x = -1 + \sqrt{6}$ or $x = -1 - \sqrt{6}$

13. $D > 0$, $x = -3 + 2\sqrt{2}$ or $x = -3 - 2\sqrt{2}$

17. $D < 0$, no real solutions

21. $x = 2$ or $x = -3$

25. $x = -\frac{3}{2} + \frac{\sqrt{5}}{2}$ or $x = -\frac{3}{2} - \frac{\sqrt{5}}{2}$

29. $x = \frac{1}{2}$ or $x = -\frac{3}{2}$

33. $x = 5 + \sqrt{2}$ or $x = 5 - \sqrt{2}$

37. $x = 1$ or $x = 2$

41. $x = -1$ or $x = \frac{5}{4}$

3. $x = -3$ or $x = -4$

7. $x = \frac{1}{2}$ or $x = -3$

11. $D < 0$, no real solutions

15. $D = 0$, $x = -1$

19.

23. $x = -4$ or $x = -7$

27. $x = 2\sqrt{2}$ or $x = -2\sqrt{2}$

31. $x = 2$

35. $x = 3$

39. $x = \frac{5}{6} + \frac{\sqrt{37}}{6}$ or $x = \frac{5}{6} - \frac{\sqrt{37}}{6}$

43. no real solutions

Exercise Set 8.2

1. $(x+1)^2 - 1$

3. $\left(x + \frac{5}{2}\right)^2 - \frac{25}{4}$

5. $\left(x - \frac{1}{2}\right)^2 - \frac{1}{4}$

7. $3(x-2)^2 - 12$

9. $4(x+3)^2 - 36$

11. $2\left(x - \frac{5}{4}\right)^2 - \frac{25}{8}$

13. $-(x-2)^2 + 4$

15. $x = 0$ or $x = -2$

17. $x = -1$ or $x = 3$

19. $x = -3 + \sqrt{5}$ or $x = -3 - \sqrt{5}$

21. $x = -\frac{1}{2}$ or $x = \frac{3}{2}$

23. $x = -2 + \frac{\sqrt{14}}{2}$ or $x = -2 - \frac{\sqrt{14}}{2}$

25. $x = -2 + \sqrt{5}$ or $x = -2 - \sqrt{5}$

27. no real solutions

29. $x = \frac{1}{2}$

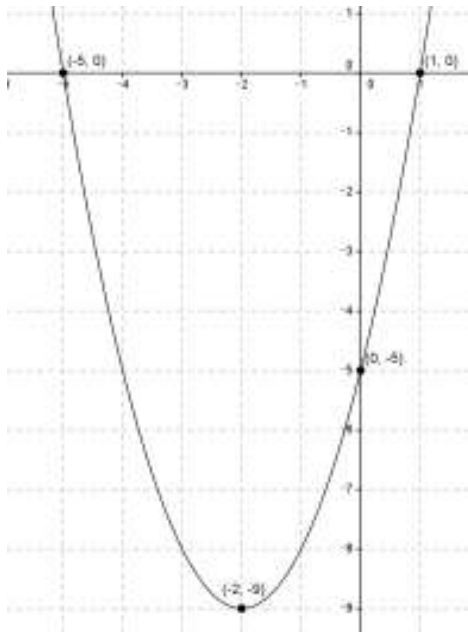
31. no real solutions

Exercise Set 8.3

1. (a) vertex: $(-2, -9)$, min. value: -9

(b) x -intercepts: $-5, 1$ y -intercept: -5

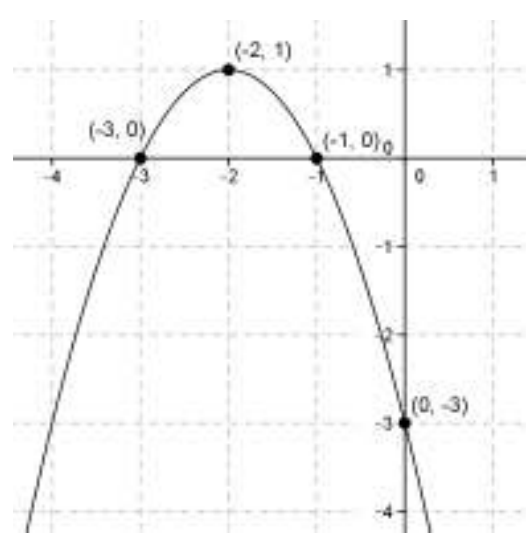
(c)



3. (a) vertex: $(-2, 1)$, max. value: 1

(b) x -intercepts: $-3, -1$ y -intercept: -3

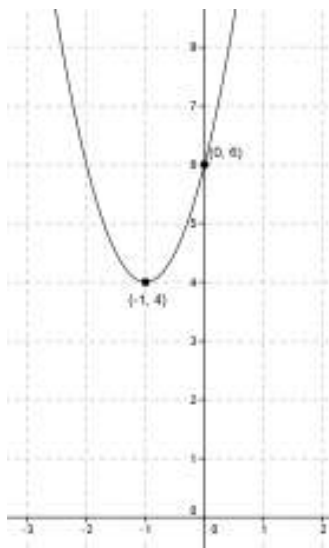
(c)



5. (a) vertex: $(-1, 4)$, min. value: 4

(b) no x -intercepts, y -intercept: 6

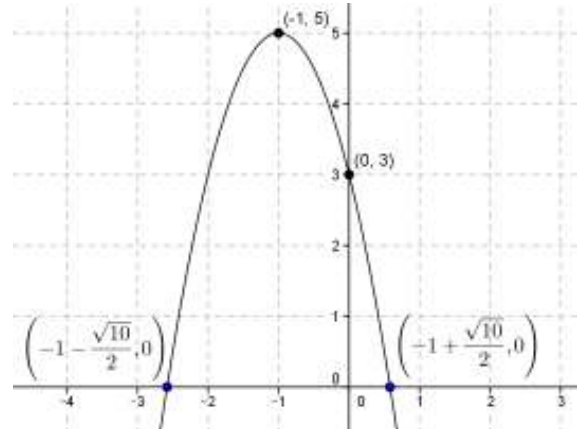
(c)



7. (a) vertex: $(-1, 5)$, max. value: 5

(b) x -intercepts: $-1 \pm \frac{\sqrt{10}}{2}$, y -intercept: 3

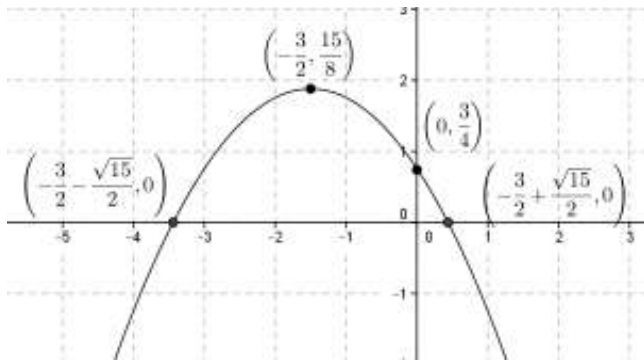
(c)



9. (a) vertex: $\left(-\frac{3}{2}, \frac{15}{8}\right)$, max. value: $\frac{15}{8}$

(b) x -intercepts: $-\frac{3}{2} \pm \frac{\sqrt{15}}{2}$, y -intercept: $\frac{3}{4}$

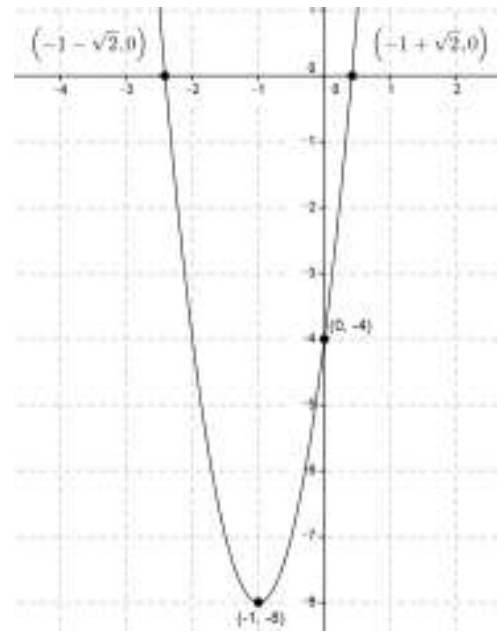
(c)



11. (a) vertex: $(-1, -8)$, min. value: -8

(b) x -intercepts: $-1 \pm \sqrt{2}$, y -intercept: -4

(c)

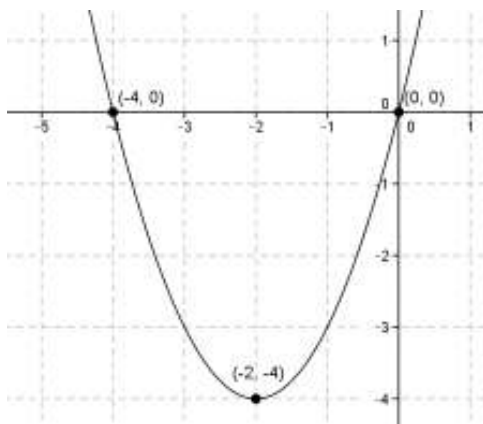


13. (a) $y = (x+2)^2 - 4$

(b) vertex: $(-2, -4)$, min. value: -4

(c) x -intercepts: -4 and 0 , y -intercept: 0

(d)

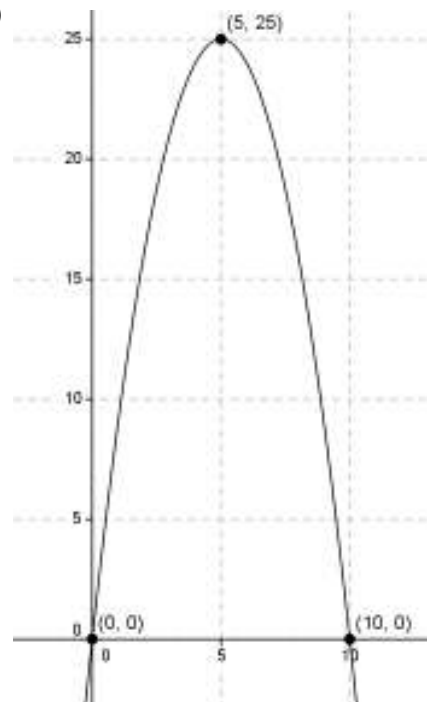


15. (a) $y = -(x-5)^2 + 25$

(b) vertex: $(5, 25)$, max. value: 25

(c) x -intercepts: 0 and 10 , y -intercept: 0

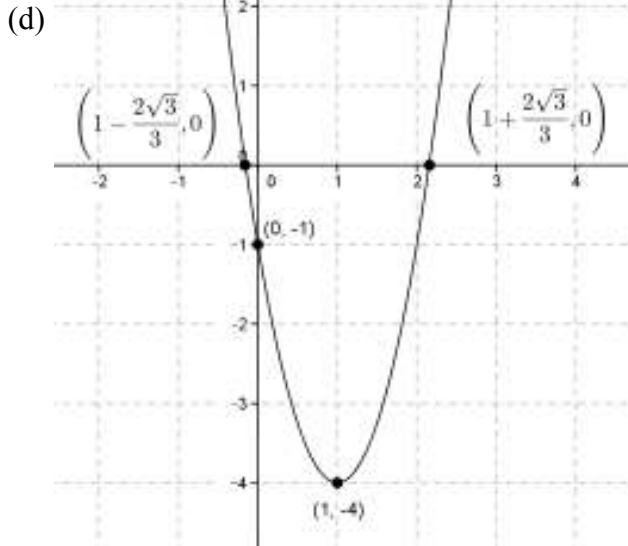
(d)



17. (a) $y = 3(x-1)^2 - 4$

(b) vertex: $(1, -4)$, min. value: -4

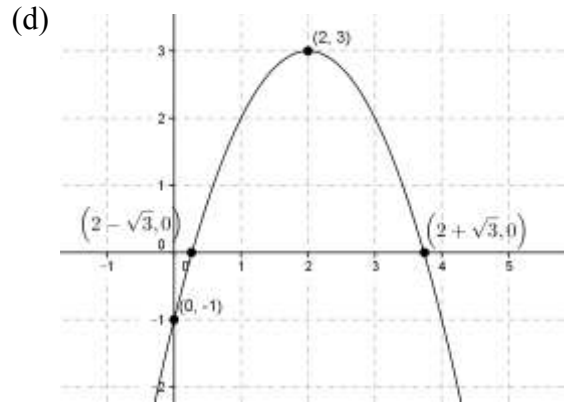
(c) x-intercepts: $1 \pm \frac{2\sqrt{3}}{3}$, y-intercept: -2



19. (a) $y = -(x-2)^2 + 3$

(b) vertex: $(2, 3)$, max. value: 3

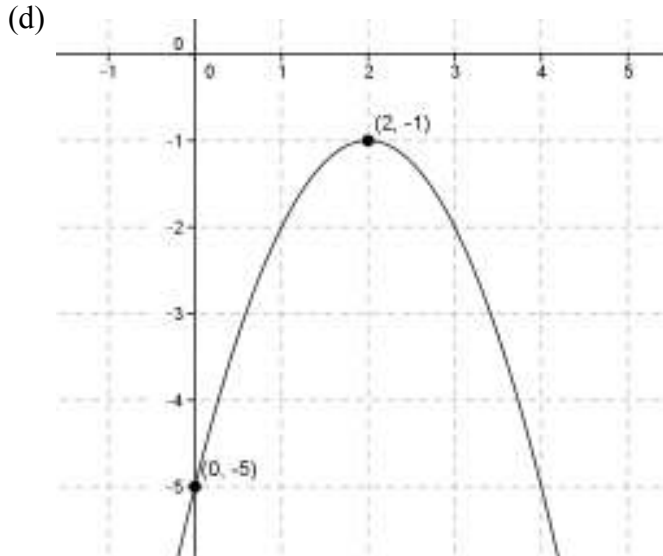
(c) x-intercepts: $2 \pm \sqrt{3}$, y-intercept: -1



21. (a) $y = -(x-2)^2 - 1$

(b) vertex: $(2, -1)$, max. value: -1

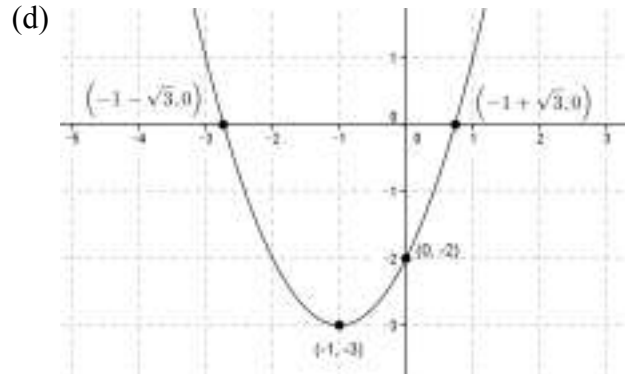
(c) no x-intercepts, y-intercept: -5



23. (a) $y = (x+1)^2 - 3$

(b) vertex: $(-1, -3)$, min. value: -3

(c) x-intercepts: $-1 \pm \sqrt{3}$, y-intercept: -2



Exercise Set 8.4

1. 5 and 7

7. 8, 24, and $8\sqrt{10}$

13. 56 inches

3. 8 and 13

9. 19

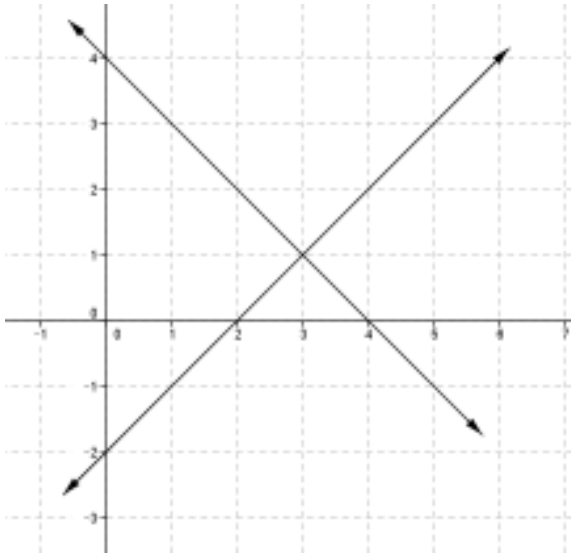
15. \$1,680

5. 7 and 21

11. 18 feet

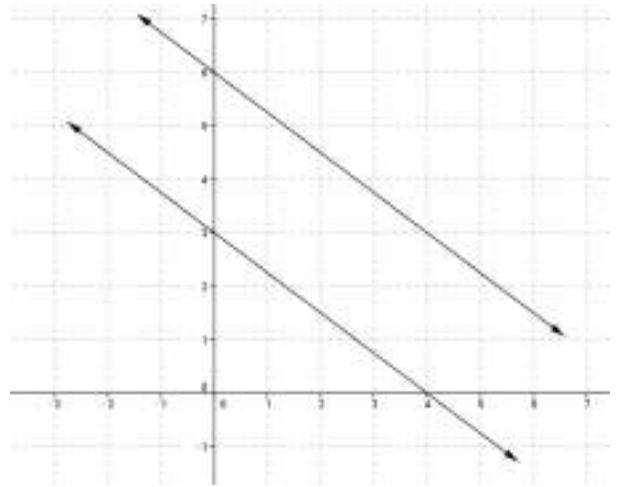
Exercise Set 9.1

1.



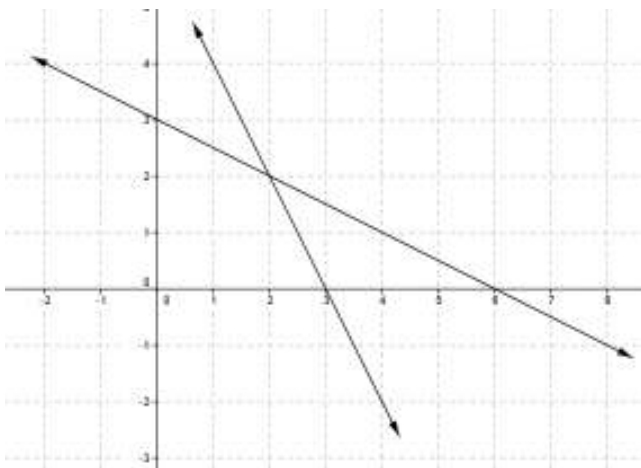
Solution: (3,1)

3.



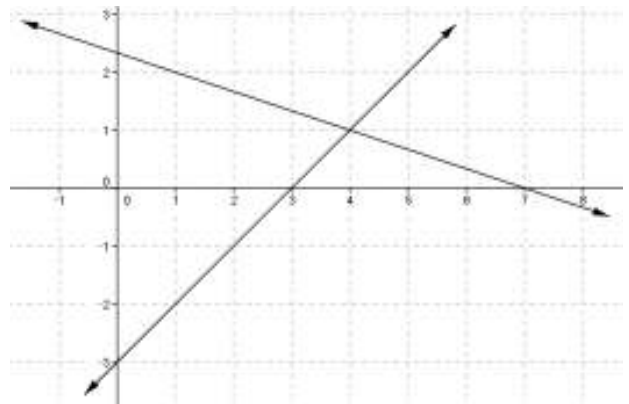
No solution.

5.



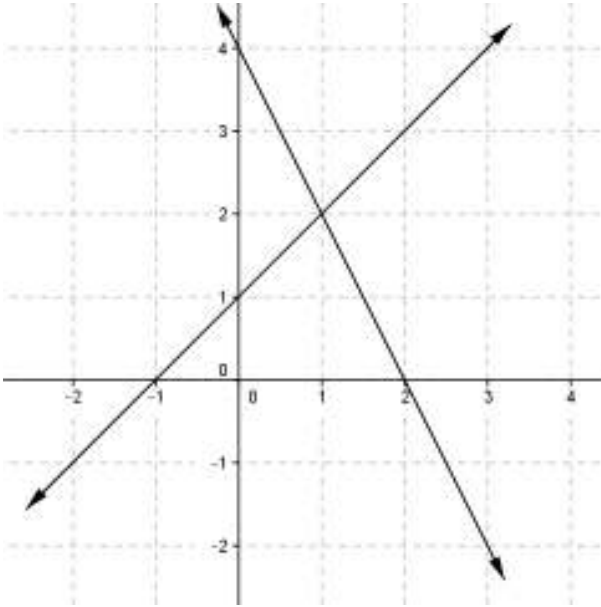
Solution: (2,2)

7.



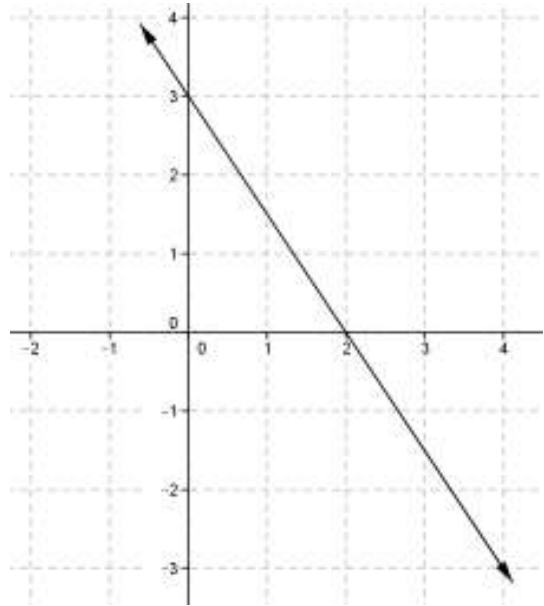
Solution: (4,1)

9.



Solution: (1,2)

11.



Infinitely many solutions

Exercise Set 9.2

1. $\left(\frac{3}{5}, \frac{11}{5}\right)$

3. (-1,2)

5. (2,-1)

7. (1,3)

9. (-7,8)

11. $\left(\frac{1}{2}, -\frac{5}{2}\right)$

13. (3,4)

15. (4,3)

17. (1,-1)

19. (3,5)

21. (2,1)

23. $\left(\frac{3}{2}, \frac{1}{3}\right)$

25. (-1,-3)

27. (4,-1)

29. (5,4)

31. (3,-1)

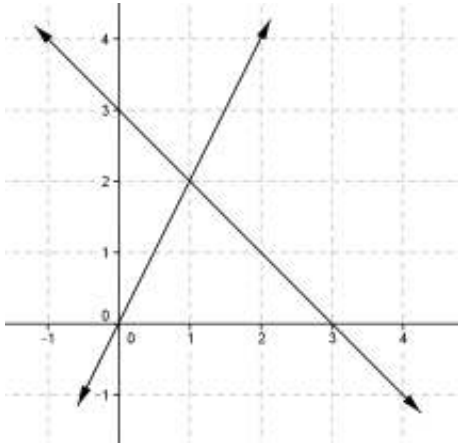
33. $\left(\frac{2}{3}, \frac{3}{4}\right)$

35. $\left(\frac{2}{5}, -1\right)$

37. No solution

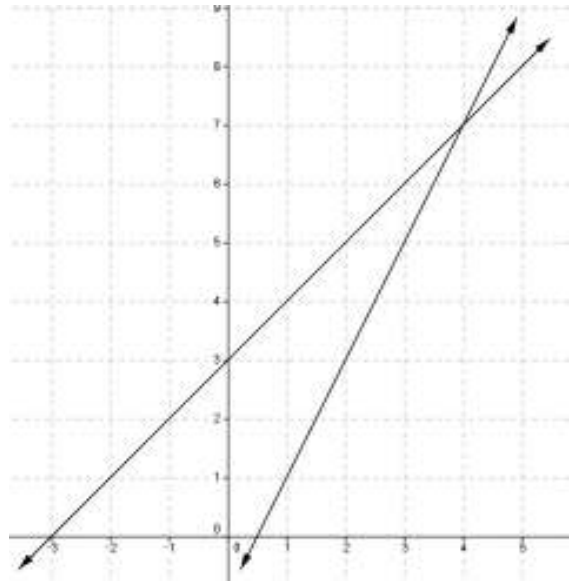
39. Infinitely many solutions

41.



Solution: (1,2)

43.



Solution: (4,7)

Exercise Set 10.1

1. 13, 8, 5, 4, 5

7. $0, 1, \sqrt{2}, 2, \sqrt{6}, 3$

13. $(-\infty, -4) \cup (-4, \infty)$

19. $(-\infty, \infty)$

25. $\left[\frac{5}{3}, \infty\right)$

31. $f(x) = \frac{1}{x-2}$

3. $\sqrt[3]{4}, 1, 0, 1, \sqrt[3]{4}$

9. $3\sqrt{2}, 2, 0, 0, 2, 2\sqrt{7}$

15. $(-\infty, \infty)$

21. $\left(-\infty, -\frac{1}{2}\right) \cup \left(-\frac{1}{2}, 1\right) \cup (1, \infty)$

27. $(-\infty, -2) \cup \left(-2, \frac{7}{3}\right) \cup \left(\frac{7}{3}, \infty\right)$

33. $f(x) = \sqrt{3x-7}$

5. $-\frac{5}{3}, -3, 1, -\frac{1}{3}, -\frac{3}{5}$

11. $-\frac{8}{15}, -\frac{4}{3}, 0, \frac{4}{3}, \frac{8}{15}$

17. $(-\infty, -5) \cup (-5, 3) \cup (3, \infty)$

23. $(-\infty, 3) \cup (3, \infty)$

29. $f(x) = \sqrt{-2-x}$

35. $f(x) = \frac{1}{\sqrt{x-2}}$

Exercise Set 10.2

1. $x = 2$

7. $x = -1$ or $x = 6$

13. $x = \frac{3}{5}$

19. $x = -2$

3. $x = \frac{1}{5}$

9. $x = 6$

15. $x = -\frac{2}{3}$

21. $x = -1$ or $x = 5$

5. $x = 5$

11. $x = -\frac{7}{2}$

17. $x = 1$ or $x = 8$