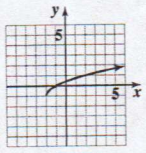
Cumulative Review Exercises (Chapters 1–6)

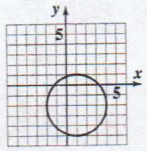
1. $-3, 1 + 2i$, and $1 - 2i$ **2.** $x = \dfrac{\log 125}{\log 11} + 1$ or $x \approx 3.01$ **3.** $(-\infty, -4] \cup [2, \infty)$ **4.** $\dfrac{\pi}{3}, \dfrac{5\pi}{3}$ **5.** $\dfrac{\pi}{4}, 2.0344, \dfrac{5\pi}{4}, 5.1760$

6.



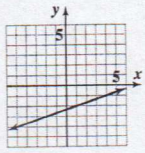
$y = \sqrt{x+2} - 1$

7.



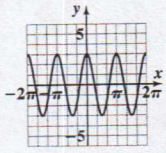
$(x-1)^2 + (y+2)^2 = 9$

8.



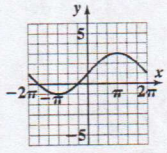
$y + 2 = \frac{1}{3}(x - 1)$

9.



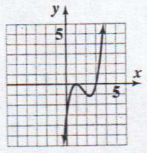
$y = 3 \cos 2x$

10.



$y = 2 \sin \frac{x}{2} + 1$

11.



$f(x) = (x-1)^2(x-3)$

12. $2a + h + 3$ **13.** $-\dfrac{\sqrt{2}}{2}$ **14.** Proofs may vary.

15. $\dfrac{16\pi}{9}$ radians **16.** $t \approx 19.1$ yr

17. $f^{-1}(x) = \dfrac{3x+1}{x-2}$ **18.** $B = 67°, b = 28.27, c = 30.71$

19. 106 mg **20.** $h \approx 15.9$ ft

CHAPTER 7

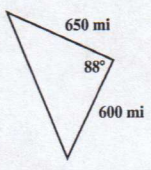
Section 7.1

Check Point Exercises

1. $B = 34°, a \approx 12.7$ cm, $b \approx 7.4$ cm **2.** $B = 117.5°, a \approx 8.7, c \approx 5.2$ **3.** $B \approx 41°, C \approx 82°, c \approx 39.0$ **4.** no triangle
5. two triangles; $B_1 \approx 50°, C_1 \approx 95°, c_1 = 20.8$; $B_2 \approx 130°, C_2 \approx 15°, c_2 \approx 5.4$ **6.** approximately 34 sq m **7.** approximately 11 mi

Exercise Set 7.1

1. $B = 42°, a \approx 8.1, b \approx 8.1$ **2.** $C = 90°, a \approx 8.0, b \approx 8.9$ **3.** $A = 44°, b \approx 18.6, c \approx 22.8$ **4.** $B = 19°, b \approx 9.6, c \approx 23.1$
5. $C = 95°, b \approx 81.0, c \approx 134.1$ **6.** $C = 162°, a \approx 33.8, b \approx 67.3$ **7.** $B = 40°, b \approx 20.9, c \approx 31.8$ **8.** $C = 40°, b \approx 31.8, c \approx 20.9$
9. $C = 111°, b \approx 7.3, c \approx 16.1$ **10.** $B = 100°, b \approx 26.1, c \approx 10.8$ **11.** $A = 80°, a \approx 39.5, c \approx 10.4$ **12.** $C = 60°, a \approx 34.5, b \approx 19.9$
13. $B = 30°, a \approx 316.0, b \approx 174.3$ **14.** $A = 50°, a \approx 1757.9, c \approx 1879.7$ **15.** $C = 50°, a \approx 7.1, b \approx 7.1$ **16.** $A = 90°, b \approx 7.9, c \approx 1.4$
17. one triangle; $B \approx 29°, c \approx 111°, c \approx 29.0$ **18.** one triangle; $B \approx 31°, C \approx 99°, c \approx 38.7$ **19.** one triangle; $C \approx 52°, B \approx 65°, b \approx 10.2$
20. one triangle; $C \approx 37°, B \approx 7°, b \approx 10.1$ **21.** one triangle; $C \approx 55°, B \approx 13°, b \approx 10.2$ **22.** one triangle; $B \approx 12°, C \approx 6°, c \approx 2.1$
23. no triangle **24.** no triangle **25.** two triangles; $B_1 \approx 77°, C_1 \approx 43°, c_1 \approx 12.6$; $B_2 \approx 103°, C_2 \approx 17°, c_2 \approx 5.4$
26. two triangles; $B_1 \approx 27°, C_1 \approx 133°, c_1 \approx 64.2$; $B_2 \approx 153°, C_2 \approx 7°, c_2 \approx 10.7$
27. two triangles; $B_1 \approx 54°, C_1 \approx 89°, c_1 \approx 19.9$; $B_2 \approx 126°, C_2 \approx 17°, c_2 \approx 5.8$
28. two triangles; $B_1 \approx 56°, C_1 \approx 112°, c_1 \approx 31.2$; $B_2 \approx 124°, C_2 \approx 44°, c_2 \approx 23.4$
29. two triangles; $C_1 \approx 68°, B_1 \approx 54°, b_1 \approx 21.0$; $C_2 \approx 112°, B_2 \approx 10°, b_2 \approx 4.5$
30. two triangles; $C_1 \approx 83°, B_1 \approx 48°, b_1 \approx 93.5$; $C_2 \approx 97°, B_2 \approx 34°, b_2 \approx 70.4$ **31.** no triangle **32.** no triangle **33.** 297 sq ft
34. 187 sq ft **35.** 5 sq yd **36.** 16 sq yd **37.** 10 sq m **38.** 157 sq m **39.** 481.6 **40.** 699.1 **41.** 64.4 **42.** 53.8
43. $A \approx 82°, B \approx 41°, C \approx 57°, c \approx 255.7$ **44.** $A \approx 96°, B \approx 48°, C \approx 36°, c \approx 237.3$ **45.** 10 **46.** 10
47. Station A is about 6 miles from the fire, station B is about 9 miles from the fire. **48.** Station A is about 33 miles from the illegal radio station, station B is about 27 miles from the illegal radio station. **49.** The platform is about 3672 yards from one end of the beach and 3576 yards from the other. **50.** about 264.4 yd or 793 ft **51.** about 184 ft **52.** about 233 ft **53.** about 56 ft **54.** about 81 ft **55.** about 30 ft
56. about 16 ft **57. a.** $a \approx 494$ ft **b.** about 343 ft **58. a.** about 11,110 ft **b.** $a \approx 4556$ ft **c.** about 4162 ft **59.** either 9.9 mi or 2.4 mi
60. yes; about 88° **71.** does not make sense **72.** makes sense **73.** does not make sense **74.** makes sense **75.** no **76.** about 257 ft
77. 41 ft **78.** 127° **79.** $\sqrt{7280} = 4\sqrt{455} \approx 85$ **80.**



Section 7.2

Check Point Exercises

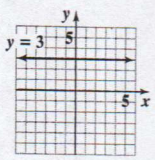
1. $a = 13, B \approx 28°, C \approx 32°$ **2.** $A \approx 52°, B \approx 98°, C \approx 30°$ **3.** approximately 917 mi apart **4.** approximately 47 sq m

Exercise Set 7.2

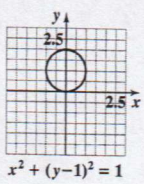
1. $a \approx 6.0, B \approx 29°, C \approx 105°$ **2.** $b \approx 4.3, A \approx 48°, C \approx 100°$ **3.** $c \approx 7.6, A \approx 52°, B \approx 32°$ **4.** $a \approx 9.7, B \approx 13°, C \approx 145°$
5. $A \approx 44°, B \approx 68°, C \approx 68°$ **6.** $A \approx 38°, B \approx 49°, C \approx 93°$ **7.** $A \approx 117°, B \approx 36°, C \approx 27°$ **8.** $B \approx 125°, A \approx 31°, C \approx 24°$
9. $c \approx 4.7, A \approx 46°, B \approx 92°$ **10.** $C \approx 7.1, B \approx 6°, A \approx 159°$ **11.** $a \approx 6.3, C \approx 28°, B \approx 50°$ **12.** $a \approx 4.3, C \approx 13°, B \approx 67°$
13. $b \approx 4.7, C \approx 54°, A \approx 76°$ **14.** $b \approx 5.7, A \approx 35°, C \approx 90°$ **15.** $b \approx 5.4, C \approx 22°, A \approx 68°$ **16.** $b \approx 7.6, C \approx 23°, A \approx 67°$
17. $C \approx 112°, A \approx 28°, B \approx 40°$ **18.** $C \approx 127°, A \approx 21°, B \approx 32°$ **19.** $B \approx 100°, A \approx 19°, C \approx 61°$ **20.** $B \approx 86°, A \approx 35°, C \approx 59°$

21. $A = 60°, B = 60°, C = 60°$ **22.** $A = 60°, B = 60°, C = 60°$ **23.** $A \approx 117°, B \approx 18°, C = 45°$ **24.** $A \approx 139°, B \approx 14°, C \approx 27°$
25. 4 sq ft **26.** 9 sq ft **27.** 22 sq m **28.** 33 sq m **29.** 31 sq yd **30.** 16 sq yd **31.** $A \approx 31°, B \approx 19°, C = 130°, c \approx 19.1$
32. $A \approx 54°, B \approx 31°, C = 95°, c \approx 3.7$ **33.** $A \approx 51°, B \approx 61°, C \approx 68°, AB = 9, AC = 8.5, BC = 7.5$
34. $A \approx 38°, B \approx 61°, C \approx 81°, AB = 11.8, AC = 10.5, BC = 7.3$ **35.** $A \approx 145°, B \approx 13°, C \approx 22°, a = \sqrt{61} \approx 7.8, b = \sqrt{10} \approx 3.2, c = 5$
36. $A \approx 42°, B \approx 71°, C \approx 67°, a = \sqrt{13} \approx 3.6, b = \sqrt{26} \approx 5.1, c = 5$ **37.** 157° **38.** 100° **39.** about 61.7 mi apart
40. about 799.9 mi **41.** about 193 yd **42.** about 113 yd **43.** N12°E **44.** N46°W **45. a.** about 19.3 mi **b.** S58°E
46. a. about 23.1 mi **b.** S68°E **47.** The guy wire anchored downhill is about 417.4 feet. The one anchored uphill is about 398.2 feet.
48. The guy wire anchored downhill is about 260.2 feet long; the one anchored uphill is about 239.3 feet long **49.** about 63.7 ft **50.** about 42.6 ft
51. \$123,454 **52.** \$294,968 **60.** does not make sense **61.** makes sense **62.** makes sense **63.** makes sense
64. about 8.9 in. and 23.9 in. **65.** $A \approx 29°, B \approx 87°, C \approx 64°, a \approx 11.6, b \approx 23.9$ **66.** $\sqrt{m^2 + h^2 - mh}$

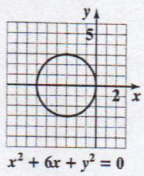
68.



69.



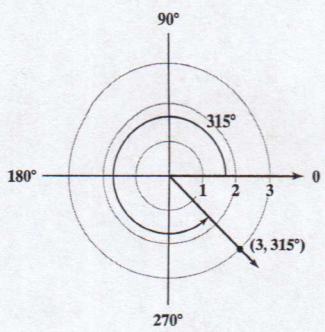
70. $(x + 3)^2 + y^2 = 9$; center: $(-3, 0)$; radius: 3;



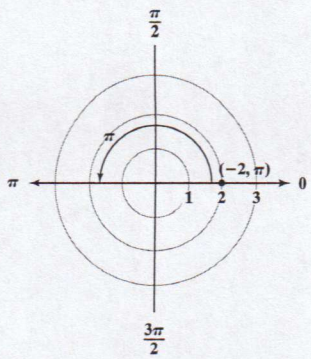
Section 7.3

Check Point Exercises

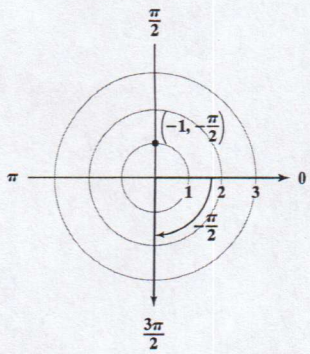
1. a.



b.



c.



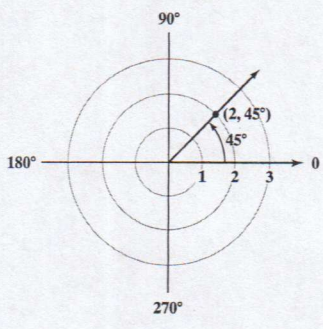
2. a. $\left(5, \frac{9\pi}{4}\right)$ **b.** $\left(-5, \frac{5\pi}{4}\right)$ **c.** $\left(5, -\frac{7\pi}{4}\right)$ **3. a.** $(-3, 0)$ **b.** $(-5\sqrt{3}, -5)$ **4.** $\left(2, \frac{5\pi}{3}\right)$ **5.** $\left(4, \frac{3\pi}{2}\right)$

6. a. $r = \frac{6}{3\cos\theta - \sin\theta}$ **b.** $r = -2\sin\theta$ **7. a.** $x^2 + y^2 = 16$ **b.** $y = -x$ **c.** $x = -2$ **d.** $x^2 + (y - 5)^2 = 25$

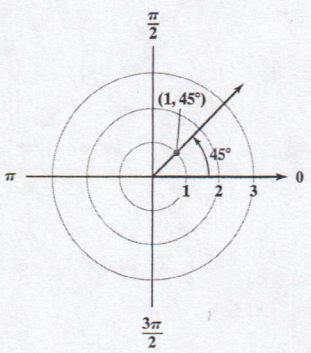
Exercise Set 7.3

1. *C* **2.** *D* **3.** *A* **4.** *C* **5.** *B* **6.** *B* **7.** *C* **8.** *A* **9.** *A* **10.** *D*

11.



12.



13.