1.
$\sin\theta = \frac{5}{\sqrt{29}}$

$\cos\theta = \frac{2}{\sqrt{29}}$

$\tan\theta = \frac{5}{2}$

$\csc\theta = \frac{\sqrt{29}}{5}$

$\sec\theta = \frac{\sqrt{29}}{2}$

$\cot\theta = \frac{2}{5}$

2.
(a) $\sin(1800^\circ) = \sin(0^\circ) = 0.$

(b) $\cot(540^\circ) = \cot(180^\circ) =$ undefined.

3.
$\csc\theta = \frac{1}{\sin\theta}$

$\sec\theta = \frac{1}{\cos\theta}$

$\cot\theta = \frac{1}{\tan\theta}$

$\sin\theta = \frac{1}{\csc\theta}$

$\cos\theta = \frac{1}{\sec\theta}$

$\tan\theta = \frac{1}{\cot\theta}$

4.
$\sin^2\theta + \cos^2\theta = 1$

$\tan^2\theta + 1 = \sec^2\theta$

$\cot^2\theta + 1 = \csc^2\theta$

5.

$$\frac{\sin\theta}{\cos\theta} = \tan\theta$$

$$\frac{\cos\theta}{\sin\theta} = \cot\theta$$

6.
$\sin\theta = \frac{\sqrt{13}}{4}$

$\tan\theta = -\frac{\sqrt{13}}{\sqrt{3}} = -\frac{\sqrt{3}\sqrt{13}}{3}$

7. $\sec\theta = -\frac{4}{3}$

8. $A = 64°, B = 26°$

9.
   (a) $\frac{4\pi}{3}$

   (b) $60°, \frac{\pi}{3}$

   (c) $\csc\theta = -\frac{2\sqrt{3}}{3}$

10. $\frac{3600°}{7}$

11. $51°\ 20'\ 24''$

12. $\frac{-4\sqrt{3}-15}{3}$

13. $\mathrm{A} = 24\pi\ \mathrm{cm}^2$

14. $\cot\theta = -\frac{21}{20}$

15.
(a) 4π

(b) 2

(c) $-\frac{4\pi}{3}$

16.

$\sin(150°) = \frac{1}{2}$

$\cos(150°) = -\frac{\sqrt{3}}{2}$

$\tan(150°) = -\frac{1}{\sqrt{3}}$

$\csc(150°) = 2$

$\sec(150°) = -\frac{2}{\sqrt{3}}$

$\cot(150°) = -\sqrt{3}$

17. $\dfrac{\pi}{6}$

18. $\dfrac{\pi}{4}$

19.
   (a) $(-\infty, 0) \cup (0, \infty)$

   (b) $f(x) = \dfrac{1}{x}$

20. Various answers are possible.
21. Various answers are possible.
22. Various answers are possible.

23. Various answers are possible.
24. Various answers are possible.
25. $\frac{\sqrt{3}}{2}$
26. (a) $\sin(30°)$ (b) $\frac{1}{2}$
27. (a) $\sin(150°)$ (b) $\frac{1}{2}$
28.
    (a) $\cos(A+B) = 87/425$
    (b) $\sin(A+B) = 416/425$
29.
    (a) $\cos(\theta) = -4/5$
    (b) $\sin(2\theta) = 24/25$
    (c) $\cos(2\theta) = 7/25$
30.
$\cos(75°) = \sqrt{\frac{1+\cos(150°)}{2}} = \frac{\sqrt{2-\sqrt{3}}}{2}$
31.
(G)None of (A) through (F). The solution set is $\{210° + k(360°), 330° + k(360°), k \text{ is any integer}\}$
32. $\frac{13\pi}{6}, \frac{23\pi}{6}$
33. $x = \frac{\pi}{4}, \frac{5\pi}{4}$
34. (C)
35. $\theta = 0, 2\pi$
36. $\theta = \frac{\pi}{3}, \pi, \frac{5\pi}{3}$
37. (C)
38. $x = -\frac{\sqrt{2}}{2}$
39. $x = 3 + \pi$
40. $x = \frac{3}{5}$
41. $x = -\frac{1}{2}$
42.
    (a) $B = 87.3°, C = 62.7°, b = 17.98$
    (b) $B = 32.7°, C = 117.3°, b = 9.73$
43. $A = 82.8, B = 41.4°, C = 55.8°$
44. $A = 38.4°, C = 96.6°, b = 5.7$

45. $(r, \theta) = (4, \frac{5\pi}{3})$

46. $(x, y) = (-\sqrt{2}, \sqrt{2})$

47. (A)

48. (B)

49. $y = 10$

50. $x^2 - y^2 = 1$

51. $r = \frac{7 \sin\theta}{cos^2\theta}$

52. $\sqrt{2}(\cos(\frac{5\pi}{4}) + i \sin(\frac{5\pi}{4}))$

53. $-\frac{7}{2} + \frac{7\sqrt{3}}{2}i$

54. $24(\cos(\frac{13\pi}{40}) + i \sin(\frac{13\pi}{40}))$

55. (C)

56. -4

57. Find all the complex square roots of $w = 16(\cos(\frac{4\pi}{3}) + i \sin(\frac{4\pi}{3}))$ Answers: $-2 + 2\sqrt{3}i, 2 - 2\sqrt{3}i$

58. (D)

59. $\sqrt{3} + i, -\sqrt{3} + i, -2i$

60.
    (a) $||u|| = \sqrt{6}$
    (b) $||v|| = \sqrt{6}$
    (c) $u \cdot v = 3\sqrt{2}$
    (d) $\theta = \frac{\pi}{4}$
    (e) $\frac{\sqrt{6}}{3}i + \frac{\sqrt{3}}{3}j$
    (f) $\frac{\sqrt{2}+2}{2}i + \frac{\sqrt{2}-2}{2}j$