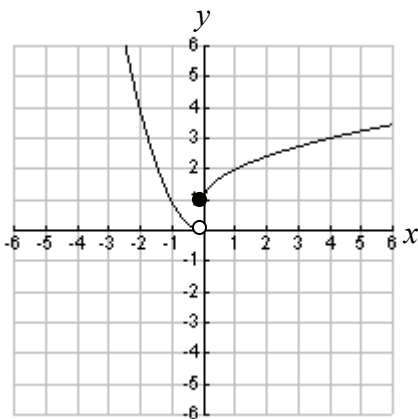


1.



2. **B**

3. a. jump
 b. infinite
 c. removable

4. **B**

5. a. odd
 b. even
 c. even

6. **C**

7. Domain: $[-6, 1) \cup (1, 4]$ Range: $[-2, 7]$

8. a. $f^{-1}(x) = x^2 - 2, x \geq 0$

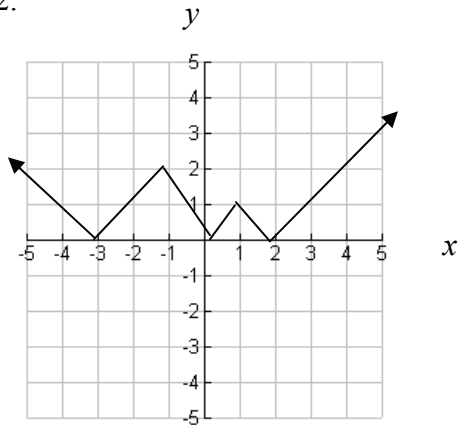
b. $f^{-1}(x) = \sqrt[3]{x-4}$

9. a. true
 b. false

10. **B, C, A, D**

11. **A**

12.



13.

$$\sin \theta = \frac{y}{r} \quad \cos \theta = \frac{x}{r} \quad \tan \theta = \frac{y}{x}$$

$$\cot \theta = \frac{x}{y} \quad \sec \theta = \frac{r}{x} \quad \csc \theta = \frac{r}{y}$$

14. $\cos \theta = \frac{3}{5}, \tan \theta = -\frac{4}{3}, \cot \theta = -\frac{3}{4}, \sec \theta = \frac{5}{3}, \csc \theta = -\frac{5}{4}$

15. a. II

b. III

c. III

16. a. $\frac{2\pi}{9}$

b. $\frac{11\pi}{12}$

17. a. $\sin \theta = 0.6$

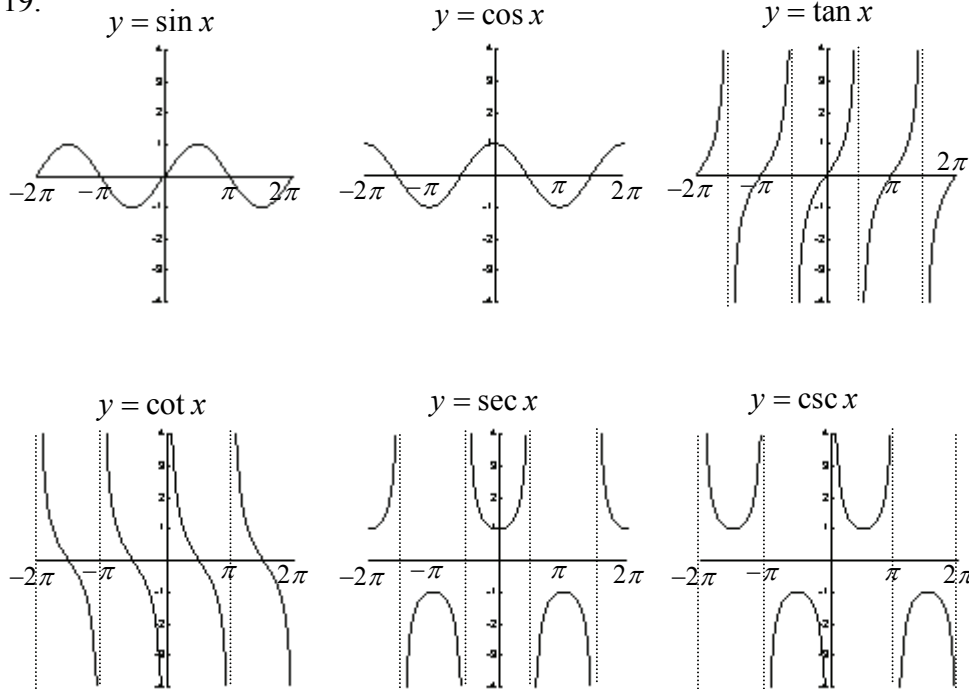
b. $\cos \theta = 0.8$

c. $\tan \theta = \frac{3}{4}$

18.

- | | | | | | |
|----|---|----|---|----|--|
| a. | $\frac{1}{2}$ | b. | $-\frac{1}{\sqrt{2}} = -\frac{\sqrt{2}}{2}$ | c. | $-\sqrt{3}$ |
| d. | -1 | e. | -1 | f. | <i>undefined</i> |
| g. | 1 | h. | $-\frac{1}{2}$ | i. | $\frac{1}{2}$ |
| j. | $\frac{1}{\sqrt{2}} = \frac{\sqrt{2}}{2}$ | k. | $-\frac{\sqrt{3}}{2}$ | l. | $\frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$ |
| m. | $-\sqrt{2}$ | n. | $-\sqrt{3}$ | o. | $-\frac{2}{\sqrt{3}} = -\frac{2\sqrt{3}}{3}$ |

19.



20. **B**

21. a. i. $\tan^{-1}x$ ii. $\sin^{-1}x$ iii. $\cos^{-1}x$

b.

	$\sin^{-1}x$	$\cos^{-1}x$	$\tan^{-1}x$
Domain	$[-1,1]$	$[-1,1]$	$(-\infty, \infty)$
Range	$\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$	$[0, \pi]$	$\left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$

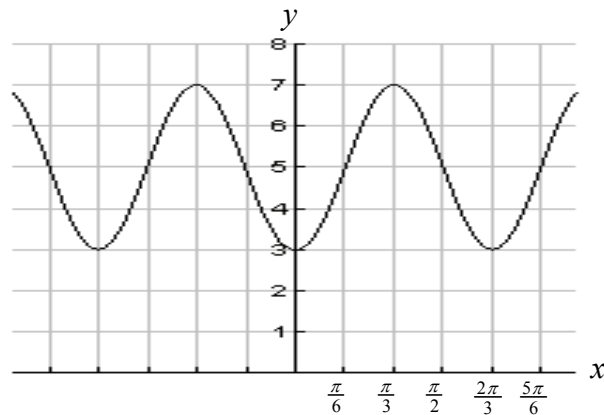
22.

- a. $\frac{\pi}{6}$
- b. $\frac{3\pi}{4}$
- c. $\frac{\pi}{3}$
- d. $-\frac{\pi}{2}$
- e. $\frac{\pi}{2}$
- f. $-\frac{\pi}{4}$
23. a. $\frac{1}{2}$
- b. $-\frac{\sqrt{2}}{2}$
- c. -1
24. a. $\frac{5}{8}$
- b. $\frac{12}{5}$
- c. $\frac{\pi}{6}$
- d. $-\frac{4}{5}$

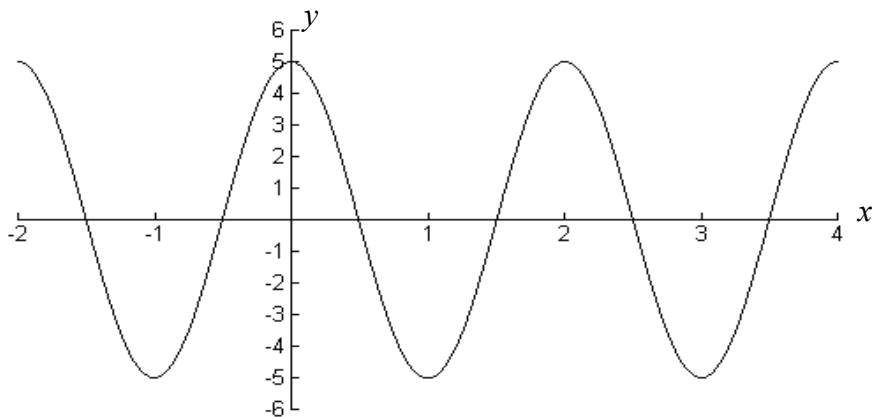
25. a. $y = 2 \sin x + 5$
 b. $y = 3 \sin(\pi x)$
 c. $y = 4 \cos\left(x - \frac{\pi}{6}\right) - 2$

26. $y = 3 \sin\left(\frac{\pi}{3}\left(x - \frac{\pi}{2}\right)\right)$

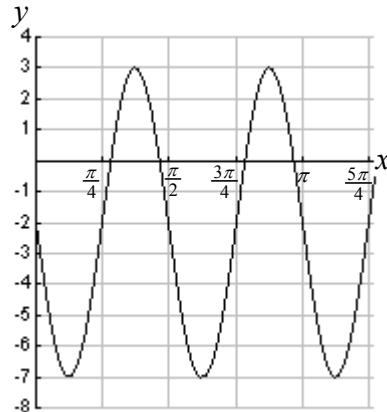
- 27a. amplitude 2, period $\frac{2\pi}{3}$, phase shift right $\frac{\pi}{6}$, vertical translation up 5



- 27b. amplitude 5, period 2, phase shift left 1, vertical translation 0



27c. Amplitude 5, period $\frac{\pi}{2}$, Phase shift $\frac{\pi}{4}$ right, vertical translation down 2



28. a. $\sin \frac{\pi}{4} = \frac{\sqrt{2}}{2}$

b. $\cos \pi = -1$

29.

a. $\sin 2A = 2 \sin A \cos A = 2 \left(\frac{5}{13} \right) \left(-\frac{12}{13} \right) = -\frac{120}{169}$

b. $\cos 2A = \cos^2 A - \sin^2 A = \left(-\frac{12}{13} \right)^2 - \left(\frac{5}{13} \right)^2 = \frac{119}{169}$

30.

a. $\sin \theta \cot \theta = \sin \theta \cdot \frac{\cos \theta}{\sin \theta} = \cos \theta$

b.

$$(\sin x + \cos x)^2 = \sin^2 x + 2 \sin x \cos x + \cos^2 x = \sin^2 x + \cos^2 x + 2 \sin x \cos x = 1 + \sin 2x$$

c. $\frac{\csc x}{1 + \cot^2 x} = \frac{\csc x}{\csc^2 x} = \frac{1}{\csc x} = \sin x$

d. $\frac{\sin \theta}{\cos \theta} + \frac{\cos \theta}{\sin \theta} = \frac{\sin^2 \theta}{\sin x \cos x} + \frac{\cos^2 \theta}{\sin x \cos x} = \frac{1}{\sin x \cos x} = \frac{1}{\cos x} \cdot \frac{1}{\sin x} = \sec \theta \csc \theta$

e.

$$\sin(x + y) + \sin(x - y) = \sin x \cos y + \cos y \sin x + \sin x \cos y - \cos y \sin x = 2 \sin x \cos y$$

f. $\sin^2 \theta + \sin^2 \theta \tan^2 \theta = \sin^2 \theta (1 + \tan^2 \theta) = \sin^2 \theta \sec^2 \theta = \frac{\sin^2 \theta}{\cos^2 \theta} = \tan^2 \theta$

31. a. $\theta = 225^\circ, 315^\circ$

b. $\theta = 120^\circ, 240^\circ$

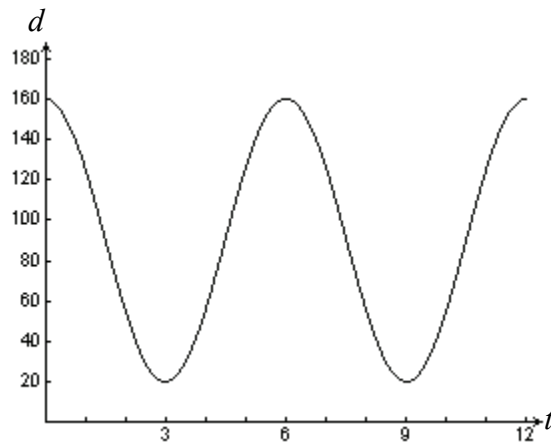
32. a. $x = \frac{3\pi}{4}, \frac{7\pi}{4}$

b. $x = \frac{\pi}{6}, \frac{\pi}{2}, \frac{5\pi}{6}$

33.

Radius	Angle(Radians)	Arc Length
6 inches	$\frac{\pi}{4}$	$\frac{3\pi}{2}$ inches
18 feet	$\frac{5\pi}{6}$	15π feet
10 meters	3	30 meters

34. a.

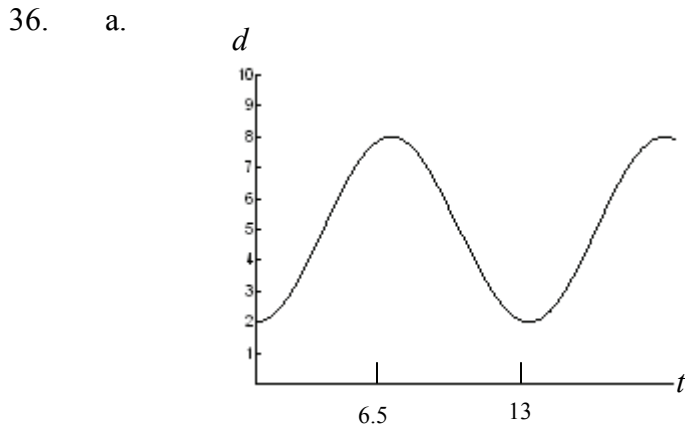


b. $d = 70 \cos\left(\frac{\pi}{3}t\right) + 90$

c. 125 cm

d. 2.260 s

35. a. $h(t) = 30 \cos\left(\frac{\pi}{4}(t-3)\right) + 50$ (other answers are acceptable)
- b. $h(11.5) = 77.716$ ft
- c. 1.929 sec, 4.071 sec



- b. $d(t) = 5 - 3 \cos\left(\frac{2\pi}{13}t\right)$
- c. approximately 1:44 a.m.
37. a. $131.81^\circ, 228.19^\circ$
- b. $199.471^\circ, 340.529^\circ$
38. no triangles
39. 16.915
40. 47.922°
41. $m\angle B = 72.212^\circ, m\angle C = 49.788^\circ, c = 10.266$ and
 $m\angle B = 107.788^\circ, m\angle C = 14.212^\circ, c = 3.3$
42. 285.630 ft
43. 643.470 ft
44. 7391.462 ft

45. 31.114 ft
46. 5.698 miles
47. a. 10
b. 105.3
48. a. 17658.952 sq. ft.
b. \$22702.05