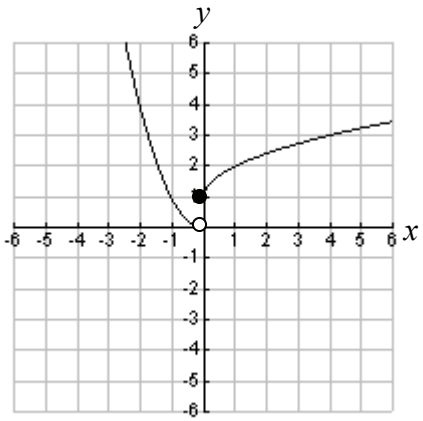
1.



2. **B**

3. a. jump
   b. infinite
   c. removable

4. **B**

5. a. odd
   b. even
   c. neither even nor odd

6. **C**

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

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

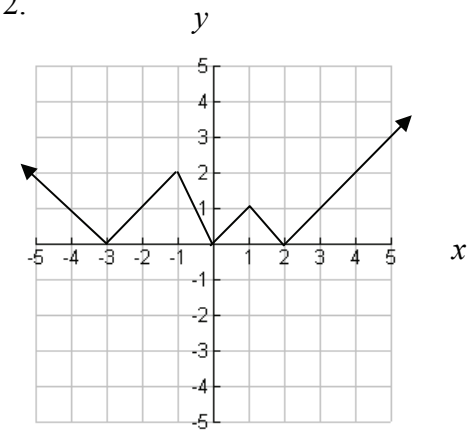
   b. $f^{-1}(x)=\sqrt[3]{x-4}$

9. a. true
   b. false

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

11. **A**

12.



13.

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

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

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. $\sin\theta = 0.6$

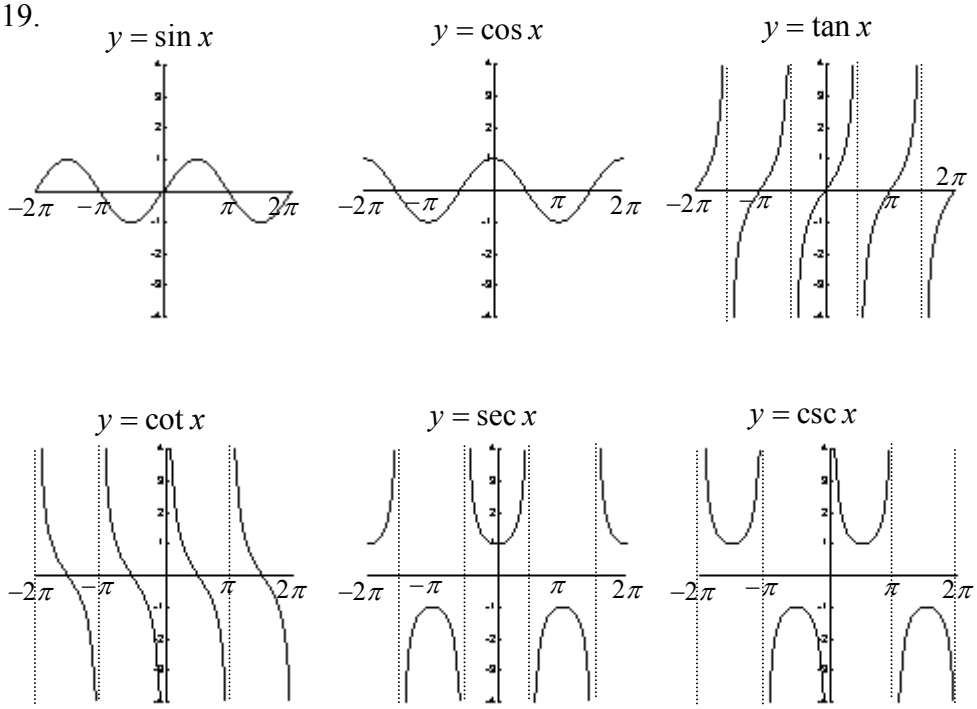
b. $\cos\theta = 0.8$

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.	*undefined*
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. $\text{Tan}^{-1}x$ ii. $\text{Sin}^{-1}x$ iii. $\text{Cos}^{-1}x$

b.

	$\text{Sin}^{-1}x$	$\text{Cos}^{-1}x$	$\text{Tan}^{-1}x$
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. $-\frac{4}{5}$

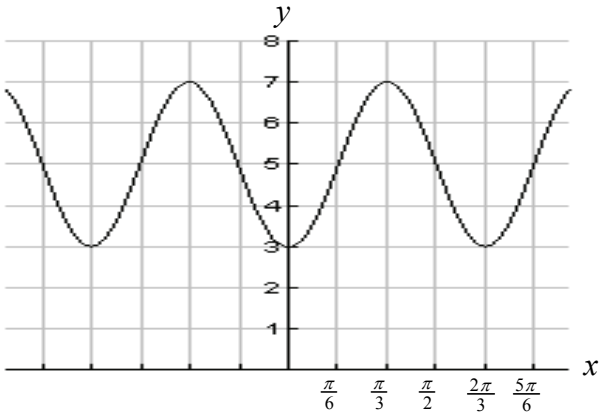
25. a. $y = 2\sin x + 5$

b. $y = 3\sin(\pi x)$

c. $y = 4\cos\left(x - \frac{\pi}{6}\right) - 2$

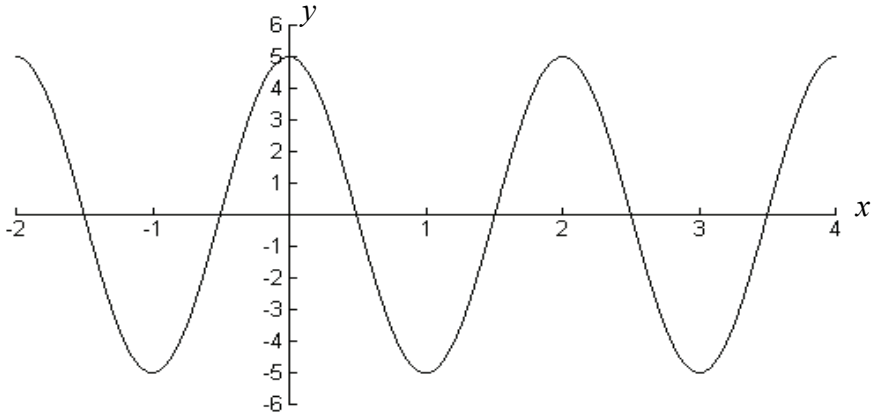
26. $y = 3\sin\left(\frac{\pi}{3}\left(x - \frac{\pi}{2}\right)\right)$

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

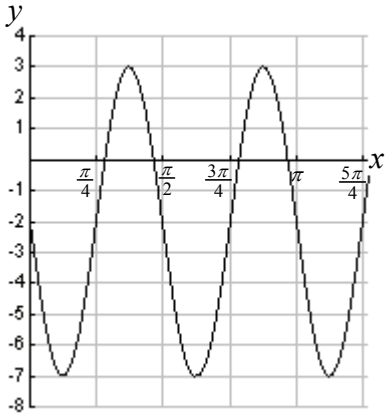


27b.

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. $\sin\frac{\pi}{4}=\frac{1}{\sqrt{2}}=\frac{\sqrt{2}}{2}$

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.

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

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

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

e.

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

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

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

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

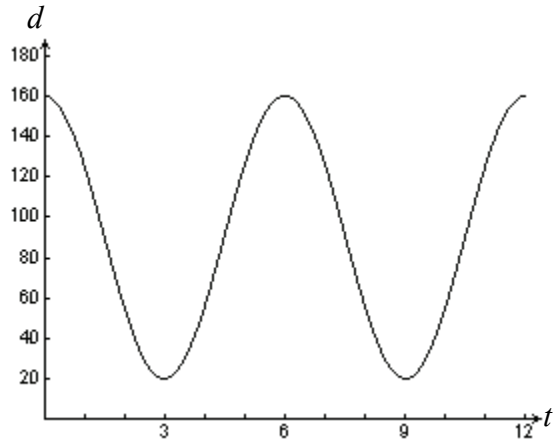
32. a. $x = \frac{3\pi}{4}, \frac{7\pi}{4}$

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

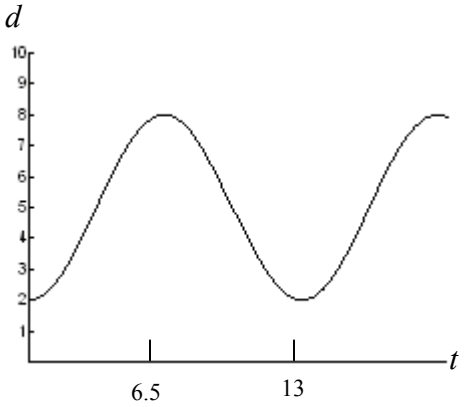
d. 2.260 s

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

36. a.



b. $d(t) = 5 - 3\cos\left(\frac{2\pi}{13}t\right)$

c. $t \approx 1.740$ hours after midnight (approximately 1:44 a.m.)

37. a. 131.8^o, 228.2^o

b. 199.5^o, 340.5^o

38. no triangles

39. 16.915

40. 47.9^o

41. $m\angle B = 72.2^o, m\angle C = 49.8^o, c = 10.3$ and
$m\angle B = 107.8^o$, $m\angle C = 14.2^o$, $c = 3.3$

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. 17,658.952 sq. ft.

    b. $22,702