

## Even Answers, Chapter 6

### 6.1

- 2) (a)  $600^\circ, 960^\circ, -120^\circ, -480^\circ$  (other answers possible)  
(b)  $675^\circ, 1035^\circ, -45^\circ, -405^\circ$  (other answers possible)  
(c)  $210^\circ, 570^\circ, -510^\circ, -870^\circ$  (other answers possible)
- 8) (a)  $27^\circ 47' 56''$  (b)  $164.1^\circ$
- 10) (a)  $\frac{2\pi}{3}$  (b)  $-\frac{3\pi}{4}$  (c)  $\frac{7\pi}{6}$
- 14) (a)  $150^\circ$  (b)  $240^\circ$  (c)  $495^\circ$
- 18)  $85^\circ 56' 37''$       22)  $83.2833^\circ$       26)  $12^\circ 51' 50''$
- 30)  $\frac{27}{\pi}$  or 8.59 km
- 32) (a)  $6\pi$  or 18.85 cm (b)  $27\pi$  or 84.82 cm<sup>2</sup>
- 34) (a)  $\theta = \frac{9}{5}, 103.1324^\circ$  (b)  $A = 360$  in<sup>2</sup>
- 36) (a) 132 cm (b) 3960 cm<sup>2</sup>
- 38) 1.16 mi.      50)  $\theta = \frac{1}{8}, 7^\circ 10'$

### 6.2

- 6)  $\sin \theta = \frac{\sqrt{8}}{3}$      $\cos \theta = \frac{1}{3}$      $\tan \theta = \sqrt{8}$   
 $\csc \theta = \frac{3}{\sqrt{8}}$      $\sec \theta = 3$      $\cot \theta = \frac{1}{\sqrt{8}}$
- 16)  $x = \frac{4}{\sqrt{2}}$  or  $2\sqrt{2}$ ,  $y = \frac{4}{\sqrt{2}}$  or  $2\sqrt{2}$
- 26) 1017 feet
- 32) (a)  $-0.1098$ , (b) 2.4380 (c)  $-0.2350$  (d) 0.3090

**I did not include the identify problem answers. (# 54, 58, 64)**

- 76)  $\sin \theta = -\frac{5}{\sqrt{34}}$      $\cos \theta = \frac{3}{\sqrt{34}}$      $\tan \theta = -\frac{5}{3}$   
 $\csc \theta = -\frac{\sqrt{34}}{5}$      $\sec \theta = \frac{\sqrt{34}}{3}$      $\cot \theta = -\frac{3}{5}$

$$\begin{aligned}
86) \quad & \sin \theta = -\frac{4}{5} \quad \cos \theta = -\frac{3}{5} \quad \tan \theta = \frac{4}{3} \\
& \csc \theta = -\frac{5}{4} \quad \sec \theta = -\frac{5}{3} \quad \cot \theta = \frac{3}{4} \\
88) \quad & \sin \theta = -\frac{\sqrt{3}}{2} \quad \cos \theta = \frac{1}{2} \quad \tan \theta = -\sqrt{3} \\
& \csc \theta = -\frac{2}{\sqrt{3}} \quad \sec \theta = 2 \quad \cot \theta = -\frac{1}{\sqrt{3}} \\
90) \quad & \sin \theta = \frac{1}{5} \quad \cos \theta = -\frac{\sqrt{24}}{5} \quad \tan \theta = -\frac{1}{\sqrt{24}} \\
& \csc \theta = 5 \quad \sec \theta = -\frac{5}{\sqrt{24}} \quad \cot \theta = -\sqrt{24}
\end{aligned}$$

### 6.3

$$\begin{aligned}
4) \quad & \sin t = -\frac{12}{13} \quad \cos t = -\frac{5}{13} \quad \tan t = \frac{12}{5} \\
& \csc t = -\frac{13}{12} \quad \sec t = -\frac{13}{5} \quad \cot t = \frac{5}{12}
\end{aligned}$$

$$6) \quad \text{a) } \left( \frac{8}{17}, -\frac{15}{17} \right) \quad \text{b) } \left( \frac{8}{17}, -\frac{15}{17} \right) \quad \text{c) } \left( -\frac{8}{17}, -\frac{15}{17} \right) \quad \text{d) } \left( \frac{8}{17}, \frac{15}{17} \right)$$

$$\begin{aligned}
12) \quad & \text{a) } \sin \frac{5\pi}{2} = 1 \quad \cos \frac{5\pi}{2} = 0 \quad \tan \frac{5\pi}{2} \text{ has no value} \\
& \csc \frac{5\pi}{2} = 1 \quad \sec \frac{5\pi}{2} \text{ has no value} \quad \cot \frac{5\pi}{2} = 0 \\
& \text{b) } \sin \left( -\frac{\pi}{2} \right) = -1 \quad \cos \left( -\frac{\pi}{2} \right) = 0 \quad \tan \left( -\frac{\pi}{2} \right) \text{ has no value} \\
& \csc \left( -\frac{\pi}{2} \right) = -1 \quad \sec \left( -\frac{\pi}{2} \right) \text{ has no value} \quad \cot \left( -\frac{\pi}{2} \right) = 0
\end{aligned}$$

$$\begin{aligned}
16) \quad & \text{a) } \sin \frac{7\pi}{4} = -\frac{1}{\sqrt{2}} \quad \cos \frac{7\pi}{4} = \frac{1}{\sqrt{2}} \quad \tan \frac{7\pi}{4} = -1 \\
& \csc \frac{7\pi}{4} = -\sqrt{2} \quad \sec \frac{7\pi}{4} = \sqrt{2} \quad \cot \frac{7\pi}{4} = -1 \\
& \text{b) } \sin \left( -\frac{3\pi}{4} \right) = -\frac{1}{\sqrt{2}} \quad \cos \left( -\frac{3\pi}{4} \right) = -\frac{1}{\sqrt{2}} \quad \tan \left( -\frac{3\pi}{4} \right) = 1 \\
& \csc \left( -\frac{3\pi}{4} \right) = -\sqrt{2} \quad \sec \left( -\frac{3\pi}{4} \right) = -\sqrt{2} \quad \cot \left( -\frac{3\pi}{4} \right) = 1
\end{aligned}$$

- 18) a) 1      b)  $-\frac{1}{\sqrt{2}}$       c) 0      24) **identity**  
 32) 0,  $\infty$       34)  $\sqrt{3}$ ,  $-\infty$   
 50)  $x = \frac{5\pi}{6}, -\frac{\pi}{6}$

#### **6.4**

- 2) a)  $15^\circ$       b)  $85^\circ$       c)  $70^\circ$       d)  $40^\circ$   
 6) a)  $2\pi - 6$  or  $16.2^\circ$       b)  $4 - \pi$  or  $49.2^\circ$   
 c)  $4.5 - \pi$  or  $77.8^\circ$       d)  $80 - 25\pi$  or  $83.7^\circ$   
 10) a)  $-\frac{1}{\sqrt{2}}$       b)  $\frac{\sqrt{3}}{2}$   
 12) a)  $-\frac{\sqrt{3}}{3}$       b)  $-1$   
 16) a)  $-\sqrt{2}$       b)  $-\frac{2}{\sqrt{3}}$   
 18) a)  $\sqrt{2}$       b)  $-\frac{2}{\sqrt{3}}$   
 22) a) 6.197      b) 0.932  
 30) a)  $78.49^\circ$       b)  $78^\circ 29'$   
 a)  $55.3^\circ, 124.7^\circ$       b)  $131.3^\circ, 228.7^\circ$   
 36) c)  $303.3^\circ, 123.3^\circ$       d)  $36.0^\circ, 216.0^\circ$   
 e)  $45.6^\circ, 314.4^\circ$       f)  $205.6^\circ, 334.4^\circ$

#### **6.5 (The graphs will not be shown on this document.)**

- 6) amplitude: 1, period:  $2\pi$ , phase shift:  $-\frac{\pi}{4}$   
 28) amplitude: 4, period  $\pi$ , phase shift:  $-\frac{\pi}{6}$   
 32) amplitude: 4, period:  $6\pi$ , phase shift:  $\pi$   
 36) amplitude:  $\sqrt{3}$ , period: 8, phase shift: 2  
 42)  $y = 3\sin(2x + \frac{\pi}{2})$   
 44)  $y = 3\sin(2\pi x + \frac{\pi}{2})$  or  $y = 3\sin[2\pi(x+1)]$

46)  $I = 510 \sin\left(\frac{\pi}{12}t\right)$

54)  $f(t) = 5 \sin\left(\frac{\pi}{12}t - \pi\right) + 15$

**6.7**

4)  $\beta = 30^\circ$ ,  $a = 3\sqrt{3}$ ,  $b = 3$

6)  $\alpha = 60^\circ$ ,  $\beta = 30^\circ$ ,  $b = 4$

12)  $\beta = 58^\circ 50'$ ,  $b = 843$ ,  $c = 985$

18)  $b = c \sin \beta$

26) 6 m

28) 76.2 m

34) 108.1 ft.

36)  $12^\circ 1'$

42) 73.5 cm

46) a) 7.5 ft.                      b) 1.5 ft.

48) 30.11 m

62) P to A:  $N15^\circ E$ , P to B:  $N30^\circ W$ , P to C:  $S80^\circ W$ , P to D:  $S55^\circ E$

64) 2.9 miles

66) a)  $288^\circ$ , b)  $\sqrt{2}$  or about 1.4 hours