

Chapter 7 Review Solutions

1a) $-90^\circ \cdot \frac{\pi}{180} = -\frac{\pi}{2}$

b) $212^\circ \cdot \frac{\pi}{180} = 3.70$

2a) $\frac{7\pi}{6} \cdot \frac{180}{\pi} = 210^\circ$

b) $3.5 \cdot \frac{180}{\pi} = 200.5^\circ$

3a) $-460^\circ, 260^\circ$ b) $680.3^\circ, -39.7^\circ$ c) $\frac{15\pi}{4}, -\frac{\pi}{4}$ d) skip

4) $s = \frac{137}{360} \cdot 2\pi(5) \approx 11.956 \text{ cm}$ $k = \frac{137}{360} \cdot \pi(5)^2 = 29.889 \text{ cm}^2$

5) $s = r\theta$

$$s = (9 \times 10^7)(0.0043)$$

$$s = 387,000 \text{ miles or } 3.87 \times 10^5$$

6) a) $\sin \theta = \frac{-\sqrt{2}}{2}$
 $\cos \theta = \frac{-\sqrt{2}}{2}$

$$\theta = 225^\circ$$

$$\theta_{\text{ref}} = 45^\circ$$

b) $\sin \theta = \frac{1}{2}$
 $\cos \theta = \frac{-\sqrt{3}}{2}$

$$\theta = 150^\circ$$

$$\theta_{\text{ref}} = 30^\circ$$

c) $\sin \theta = -1$
 $\cos \theta = 0$

$$\theta = -90$$

$$\theta_{\text{ref}} = \text{none}$$

7) a) $\sin 70^\circ > \sin 65^\circ$ b) $\cos 70^\circ < \cos 65^\circ$ c) $\cos 40^\circ = \cos 320^\circ$

d) $\sin 313^\circ < \sin 314^\circ$

8) a) $\sin \frac{5\pi}{6} = \frac{1}{2}$ b) $\cos(-180) = -1$ c) $\sin 210^\circ = -\frac{1}{2}$ d) $\cos \frac{5\pi}{6} = -\frac{\sqrt{3}}{2}$

9) a) $\sin 135^\circ = \frac{\sqrt{2}}{2}$

$$\boxed{\csc 135 = \frac{2}{\sqrt{2}} = \sqrt{2}}$$

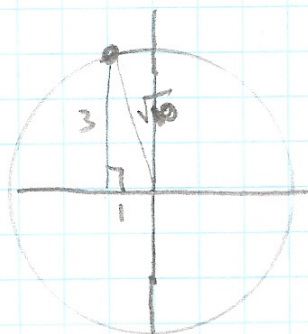
b) $\cos \frac{2\pi}{3} = -\frac{1}{2}$

$$\boxed{\sec \frac{2\pi}{3} = -2}$$

c) $\tan(-60) = -\sqrt{3}$ d) $\tan(-\pi) = 0$

$$\cot(-60) = \frac{1}{-\sqrt{3}} = -\frac{\sqrt{3}}{3}$$

10)



$$\cot x = -\frac{1}{3}$$

$$\tan x = -3$$

$$\sin x = \frac{3}{\sqrt{10}} = \frac{3\sqrt{10}}{10}$$

$$\csc x = \frac{\sqrt{10}}{3}$$

$$\cos x = \frac{1}{-\sqrt{10}} = -\frac{\sqrt{10}}{10}$$

$$\sec x = -\sqrt{10}$$

$$11) a) \tan^{-1}\left(-\frac{\sqrt{3}}{3}\right) = \theta$$

$$-30^\circ \text{ or } -\frac{\pi}{6} = \theta$$

$$b) \sec\left(\sin^{-1}\frac{1}{2}\right)$$

$$= \sec(30^\circ)$$

$$= \frac{1}{\cos 30^\circ}$$

$$= \frac{1}{\frac{\sqrt{3}}{2}}$$

$$= \frac{2}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$$

$$c) \csc\left(\cos^{-1}\left(-\frac{3}{5}\right)\right) = \csc \theta$$

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

$$\frac{1}{\frac{4}{5}} = \csc \theta$$

$$\boxed{\frac{5}{4} = \csc \theta}$$

12) The function $f(x) = \cos x$ is not a one to one when the domain consists of all real x . If we restrict the domain to $0 \leq x \leq \pi$, however, the function is one to one and therefore has an inverse.