

1. (a) $-\frac{\sqrt{3}}{2}$
(b) -1
(c) $\frac{\sqrt{6} + \sqrt{2}}{4}$
(d) -1
2. (a) true
(b) false: $\cos(-x) = \cos x$ (negative angle identity)
(c) false: $\sec^2 \frac{\pi}{4} + \csc^2 \frac{\pi}{4} = 4 \neq 1$
(d) false: $\sin\left(x - \frac{\pi}{2}\right) = \sin x \cos \frac{\pi}{2} - \cos x \sin \frac{\pi}{2} = -\cos x$
3. (a) $f(t) = 4 \sin\left(\frac{\pi}{6}t + \frac{5\pi}{6}\right)$
(b) period = 12
(c) amplitude = 4
(d) phase shift = -5
4. (a) $\cos \theta = -\frac{3}{\sqrt{13}}$
(b) $\sin \theta = \frac{2}{\sqrt{13}}$
5. (a) $A = 117.28^\circ$
(b) area = 21.33 cm^2
6. 0.94 miles
7. angular speed = $\frac{11}{5\pi} \frac{\text{rev}}{\text{sec}}$