

§5.2 TRIG FUNCTIONS OF REAL NUMBERS # 5, 9, 13, 23-27, 29, 45-57 odd, 63-69 odd

5. (a) $\sin \frac{7\pi}{6} = -\sin \frac{\pi}{6} = \boxed{-\frac{1}{2}}$

(b) $\cos \frac{17\pi}{6} = \cos \frac{5\pi}{6} = -\cos \frac{\pi}{6} = \boxed{-\frac{\sqrt{3}}{2}}$

(c) $\tan \frac{7\pi}{6} = \tan \frac{\pi}{6} = \boxed{\frac{1}{\sqrt{3}}}$

9. (a) $\cos \frac{3\pi}{4} = -\cos \frac{\pi}{4} = \boxed{-\frac{\sqrt{2}}{2}}$

(b) $\cos \frac{5\pi}{4} = -\cos \frac{\pi}{4} = \boxed{-\frac{\sqrt{2}}{2}}$

(c) $\cos \frac{7\pi}{4} = \cos \frac{\pi}{4} = \boxed{\frac{\sqrt{2}}{2}}$

13. (a) $\cos(-\frac{\pi}{3}) = \cos \frac{\pi}{3} = \boxed{\frac{1}{2}}$

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

(c) $\sin(-\frac{\pi}{3}) = -\sin \frac{\pi}{3} = \boxed{-\frac{\sqrt{3}}{2}}$

23-26.

t	$\sin t$	$\cos t$	$\tan t$	$\csc t$	$\sec t$	$\cot t$
0	0	1	0	UND	1	UND
$\frac{\pi}{2}$	1	0	UND	1	UND	0
π	0	-1	0	UND	-1	UND
$\frac{3\pi}{2}$	-1	0	UND	-1	UND	0

$$\underline{27.} \quad x = -\frac{3}{5}, \quad y = -\frac{4}{5}$$

$$\sin t = y = -\frac{4}{5}, \quad \cos t = x = -\frac{3}{5}, \quad \tan t = \frac{y}{x} = \frac{4}{3}$$

$$\underline{29.} \quad x = -\frac{1}{3}, \quad y = \frac{2\sqrt{2}}{3}$$

$$\sin t = y = \frac{2\sqrt{2}}{3}, \quad \cos t = x = -\frac{1}{3}, \quad \tan t = \frac{y}{x} = -2\sqrt{2}$$

$$\underline{45.} \quad \text{Q II: } \begin{array}{cc} \sin t & \cos t \\ \text{Pos} & \text{NEG} \end{array} = \boxed{\text{NEG}}$$

$$\underline{47.} \quad \text{Q III: } \begin{array}{cc} \text{Pos} & \text{NEG} \\ \tan t & \sin t \\ \text{COT } t & \\ \text{Pos} & \end{array} = \boxed{\text{NEG}}$$

$$\underline{49.} \quad \text{Q II}$$

$$\underline{51.} \quad \text{Q II}$$

$$\underline{53.}$$

$$\sin^2 t + \cos^2 t = 1$$

$$\boxed{\sin t = \pm \sqrt{1 - \cos^2 t}}, \quad \text{Q II}$$

$$\underline{55.} \quad \tan t = \frac{\sin t}{\cos t} = \boxed{\frac{\sin t}{\pm \sqrt{1 - \sin^2 t}}}, \quad \text{Q III}$$

$$\underline{57.} \quad \tan^2 t + 1 = \sec^2 t \rightarrow \boxed{\sec t = \pm \sqrt{\tan^2 t + 1}}, \quad \text{Q II}$$

$$\underline{63.} \quad \begin{array}{lll} \sin t = -\frac{4}{5} & \cos t = \sqrt{1 - (-\frac{4}{5})^2} = \sqrt{\frac{9}{25}} = \frac{3}{5} & \tan t = -\frac{4}{3} \\ \csc t = -\frac{5}{4} & \sec t = \frac{5}{3} & \cot t = -\frac{3}{4} \end{array}$$

$$\begin{aligned} \underline{65.} \quad \cos t &= \frac{1}{3} & \sin t &= -\sqrt{1 - \left(\frac{1}{3}\right)^2} = \frac{-2\sqrt{2}}{3} & \tan t &= -2\sqrt{2} \\ \sec t &= 3 & \csc t &= -\frac{3}{2\sqrt{2}} & \cot t &= \frac{-1}{2\sqrt{2}} \end{aligned}$$

$$\begin{aligned} \underline{67.} \quad \tan t &= -\frac{12}{5} & \sec t &= -\sqrt{\left(-\frac{12}{5}\right)^2 + 1} = -\frac{13}{5} & \sin t &= \frac{12}{13} \\ \cot t &= -\frac{5}{12} & \cos t &= -\frac{5}{13} & \csc t &= \frac{13}{12} \end{aligned}$$

$$\begin{aligned} \underline{69.} \quad \sin t &= -\frac{1}{4} & \cos t &= -\sqrt{1 - \left(-\frac{1}{4}\right)^2} = -\frac{\sqrt{15}}{4} & \tan t &= \frac{1}{\sqrt{15}} \\ \csc t &= -4 & \sec t &= -\frac{4}{\sqrt{15}} & \cot t &= \sqrt{15} \end{aligned}$$