

Pg. 251

# 9-15, 25-31, 43-57 odds

9.  $\sin \frac{\pi}{2} = 1$

10.  $\tan 2\pi = 0$

11.  $\cot(-180^\circ) = \frac{\cos(-180^\circ)}{\sin(-180^\circ)} = \frac{-1}{0} = \text{undefined}$

12.  $\csc(270^\circ) = \frac{1}{\sin(270^\circ)} = \frac{1}{-1} = -1$

13.  $\cos(-270^\circ) = 0$  ( $-270^\circ = 90^\circ$ )

14.  $\sec(180^\circ) = \frac{1}{\cos(180^\circ)} = \frac{1}{-1} = -1$

15.  $\tan \pi = \frac{\sin \pi}{\cos \pi} = \frac{0}{-1} = 0$

25.  $\cos \frac{4\pi}{3} = -\frac{1}{2}$

26.  $\tan \frac{7\pi}{6} = \frac{-\frac{1}{2}}{-\frac{\sqrt{3}}{2}} = -\frac{1}{2} \cdot -\frac{2}{\sqrt{3}} = \frac{1}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{3}}{3}$

27.  $\sin \frac{3\pi}{4} = \frac{\sqrt{2}}{2}$

28.  $\cot(-45^\circ) = \frac{-\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = -1$  ( $-45^\circ = 330^\circ$ )

29.  $\csc(390^\circ) = \frac{1}{\frac{\sqrt{3}}{2}} = \frac{2}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$  ( $390^\circ = 30^\circ$ )

30.  $\sec(-150^\circ) = \frac{1}{\cos(-150^\circ)} = \frac{1}{-\frac{\sqrt{3}}{2}} = -\frac{2}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = -\frac{2\sqrt{3}}{3}$  ( $-150^\circ = 210^\circ$ )

31.  $\tan \frac{11\pi}{6} = \frac{\sin 11\pi/6}{\cos 11\pi/6} = \frac{-1/2}{\sqrt{3}/2} = -\frac{1}{2} \cdot \frac{2}{\sqrt{3}} = -\frac{1}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = -\frac{\sqrt{3}}{3}$

43.  $\sec(120^\circ) = \frac{1}{\cos(120^\circ)} = \frac{1}{-1/2} = -2$

45.  $\cos(11\pi/3) = 1/2$

47.  $\csc(390^\circ) = \frac{1}{\sin 390^\circ} = \frac{1}{\frac{\sqrt{3}}{2}} = \frac{2}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$  ( $390^\circ = 30^\circ$ )

$$49. \csc(5400^\circ) = \frac{1}{\sin(5400)} = \frac{1}{0} = \text{undefined} \quad (5400 = 0^\circ)$$

$$51. \cot\left(-\frac{5\pi}{6}\right) = \frac{1}{\tan\left(-\frac{5\pi}{6}\right)} = \frac{\cos\left(-\frac{5\pi}{6}\right)}{\sin\left(-\frac{5\pi}{6}\right)} = \frac{-\frac{1}{2}}{-\frac{\sqrt{3}}{2}}$$

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

$$53. \tan\left(\frac{5\pi}{3}\right) = \frac{\sin\left(\frac{5\pi}{3}\right)}{\cos\left(\frac{5\pi}{3}\right)} = \frac{-\frac{\sqrt{3}}{2}}{\frac{1}{2}} = -\frac{\sqrt{3}}{2} \cdot \frac{2}{1} = -\sqrt{3}$$

$$55. \sin\left(-\frac{5\pi}{3}\right) = \frac{\sqrt{3}}{2} \quad \left(-\frac{5\pi}{3} = \frac{\pi}{3}\right)$$

$$57. \tan\left(\frac{14\pi}{3}\right) = \frac{\sin\left(\frac{14\pi}{3}\right)}{\cos\left(\frac{14\pi}{3}\right)} = \frac{\frac{\sqrt{3}}{2}}{-\frac{1}{2}} = \frac{\sqrt{3}}{2} \cdot -\frac{2}{1} = -\sqrt{3} \quad \left(\frac{14\pi}{3} = \frac{2\pi}{3}\right)$$