

1.  $\sin t = \frac{\sqrt{15}}{4}$ ;  $\cos t = \frac{1}{4}$ ;  $\tan t = \sqrt{15}$ ;  $\csc t = \frac{4\sqrt{15}}{15}$ ;  $\sec t = 4$ ;  $\cot t = \frac{\sqrt{15}}{15}$
2.  $\sin t = \frac{\sqrt{55}}{8}$ ;  $\cos t = \frac{3}{8}$ ;  $\tan t = \frac{\sqrt{55}}{3}$ ;  $\csc t = \frac{8\sqrt{55}}{55}$ ;  $\sec t = \frac{8}{3}$ ;  $\cot t = \frac{3\sqrt{55}}{55}$
3.  $\sin t = \frac{\sqrt{21}}{5}$ ;  $\cos t = -\frac{2}{5}$ ;  $\tan t = -\frac{\sqrt{21}}{2}$ ;  $\csc t = \frac{5\sqrt{21}}{21}$ ;  $\sec t = -\frac{5}{2}$ ;  $\cot t = -\frac{2\sqrt{21}}{21}$
4.  $\sin t = \frac{2\sqrt{6}}{5}$ ;  $\cos t = -\frac{1}{5}$ ;  $\tan t = -2\sqrt{6}$ ;  $\csc t = \frac{5\sqrt{6}}{12}$ ;  $\sec t = -5$ ;  $\cot t = -\frac{\sqrt{6}}{12}$
5.  $\sin t = -\frac{1}{6}$ ;  $\cos t = \frac{-\sqrt{35}}{6}$ ;  $\tan t = \frac{\sqrt{35}}{35}$ ;  $\csc t = -6$ ;  $\sec t = \frac{-6\sqrt{35}}{35}$ ;  $\cot t = \sqrt{35}$
6.  $\sin t = \frac{5}{8}$ ;  $\cos t = -\frac{\sqrt{39}}{8}$ ;  $\tan t = -\frac{5\sqrt{39}}{39}$ ;  $\csc t = \frac{8}{5}$ ;  $\sec t = -\frac{8\sqrt{39}}{39}$ ;  $\cot t = -\frac{\sqrt{39}}{5}$
7.  $\sin t = -\frac{1}{3}$ ;  $\cos t = \frac{2\sqrt{2}}{3}$ ;  $\tan t = \frac{-\sqrt{2}}{4}$ ;  $\csc t = -3$ ;  $\sec t = \frac{3\sqrt{2}}{4}$ ;  $\cot t = -2\sqrt{2}$
8.  $\sin t = -\frac{2}{3}$ ;  $\cos t = -\frac{\sqrt{5}}{3}$ ;  $\tan t = \frac{2\sqrt{5}}{5}$ ;  $\csc t = -\frac{3}{2}$ ;  $\sec t = -\frac{3\sqrt{5}}{5}$ ;  $\cot t = \frac{\sqrt{5}}{2}$
9.  $\sin t = \frac{2}{7}$ ;  $\cos t = -\frac{3\sqrt{5}}{7}$ ;  $\tan t = -\frac{2\sqrt{5}}{15}$ ;  $\csc t = \frac{7}{2}$ ;  $\sec t = -\frac{7\sqrt{5}}{15}$ ;  $\cot t = -\frac{3\sqrt{5}}{2}$
10.  $\sin t = -\frac{1}{10}$ ;  $\cos t = -\frac{3\sqrt{11}}{10}$ ;  $\tan t = \frac{\sqrt{11}}{33}$ ;  $\csc t = -10$ ;  $\sec t = -\frac{10\sqrt{11}}{33}$ ;  $\cot t = 3\sqrt{11}$
11.  $\frac{1}{2}(\sqrt{2} + 1)$
12.  $\frac{1 - \sqrt{2}}{2}$
13. 2
14. -1
15.  $\frac{1}{2}$
16.  $\frac{\sqrt{3}}{2}$
17.  $\sqrt{6}$
18.  $\frac{2\sqrt{3}}{3}$
19. 4
20. 8
21. 0
22.  $3 + \sqrt{2}$
23. 0
24.  $\frac{1 + 2\sqrt{3}}{2}$
25.  $2\sqrt{2} + \frac{4\sqrt{3}}{3}$
26.  $2\sqrt{3} + 1$
27. -1
28. -1
29. 1
30. -2
31.  $\sin\left(\frac{2\pi}{3}\right) = \frac{\sqrt{3}}{2}$ ;  $\cos\left(\frac{2\pi}{3}\right) = -\frac{1}{2}$ ;  $\tan\left(\frac{2\pi}{3}\right) = -\sqrt{3}$ ;  $\csc\left(\frac{2\pi}{3}\right) = \frac{2\sqrt{3}}{3}$ ;  $\sec\left(\frac{2\pi}{3}\right) = -2$ ;  $\cot\left(\frac{2\pi}{3}\right) = -\frac{\sqrt{3}}{3}$
32.  $\sin\frac{5\pi}{6} = \frac{1}{2}$ ;  $\cos\frac{5\pi}{6} = -\frac{\sqrt{3}}{2}$ ;  $\tan\frac{5\pi}{6} = -\frac{\sqrt{3}}{3}$ ;  $\csc\frac{5\pi}{6} = 2$ ;  $\sec\frac{5\pi}{6} = -\frac{2\sqrt{3}}{3}$ ;  $\cot\frac{5\pi}{6} = -\sqrt{3}$
33.  $\sin 210^\circ = -\frac{1}{2}$ ;  $\cos 210^\circ = -\frac{\sqrt{3}}{2}$ ;  $\tan 210^\circ = \frac{\sqrt{3}}{3}$ ;  $\csc 210^\circ = -2$ ;  $\sec 210^\circ = -\frac{2\sqrt{3}}{3}$ ;  $\cot 210^\circ = \sqrt{3}$
34.  $\sin 240^\circ = -\frac{\sqrt{3}}{2}$ ;  $\cos 240^\circ = -\frac{1}{2}$ ;  $\tan 240^\circ = \sqrt{3}$ ;  $\csc 240^\circ = -\frac{2\sqrt{3}}{3}$ ;  $\sec 240^\circ = -2$ ;  $\cot 240^\circ = \frac{\sqrt{3}}{3}$
35.  $\sin\frac{5\pi}{3} = -\frac{\sqrt{3}}{2}$ ;  $\cos\frac{5\pi}{3} = \frac{1}{2}$ ;  $\tan\frac{5\pi}{3} = -\sqrt{3}$ ;  $\csc\frac{5\pi}{3} = \frac{-2\sqrt{3}}{3}$ ;  $\sec\frac{5\pi}{3} = 2$ ;  $\cot\frac{5\pi}{3} = -\frac{\sqrt{3}}{3}$
36.  $\sin\frac{11\pi}{6} = -\frac{1}{2}$ ;  $\cos\frac{11\pi}{6} = \frac{\sqrt{3}}{2}$ ;  $\tan\frac{11\pi}{6} = -\frac{\sqrt{3}}{3}$ ;  $\csc\frac{11\pi}{6} = -2$ ;  $\sec\frac{11\pi}{6} = \frac{2\sqrt{3}}{3}$ ;  $\cot\frac{11\pi}{6} = -\sqrt{3}$
37.  $\sin\frac{7\pi}{3} = \frac{\sqrt{3}}{2}$ ;  $\cos\frac{7\pi}{3} = \frac{1}{2}$ ;  $\tan\frac{7\pi}{3} = \sqrt{3}$ ;  $\csc\frac{7\pi}{3} = \frac{2\sqrt{3}}{3}$ ;  $\sec\frac{7\pi}{3} = 2$ ;  $\cot\frac{7\pi}{3} = \frac{\sqrt{3}}{3}$
38.  $\sin\frac{13\pi}{6} = \frac{1}{2}$ ;  $\cos\frac{13\pi}{6} = \frac{\sqrt{3}}{2}$ ;  $\tan\frac{13\pi}{6} = \frac{\sqrt{3}}{3}$ ;  $\csc\frac{13\pi}{6} = 2$ ;  $\sec\frac{13\pi}{6} = \frac{2\sqrt{3}}{3}$ ;  $\cot\frac{13\pi}{6} = \sqrt{3}$
39.  $\sin 405^\circ = \frac{\sqrt{2}}{2}$ ;  $\cos 405^\circ = \frac{\sqrt{2}}{2}$ ;  $\tan 405^\circ = 1$ ;  $\csc 405^\circ = \sqrt{2}$ ;  $\sec 405^\circ = \sqrt{2}$ ;  $\cot 405^\circ = 1$
40.  $\sin 390^\circ = \frac{1}{2}$ ;  $\cos 390^\circ = \frac{\sqrt{3}}{2}$ ;  $\tan 390^\circ = \frac{\sqrt{3}}{3}$ ;  $\csc 390^\circ = 2$ ;  $\sec 390^\circ = \frac{2\sqrt{3}}{3}$ ;  $\cot 390^\circ = \sqrt{3}$
41.  $\sin\left(-\frac{\pi}{6}\right) = -\frac{1}{2}$ ;  $\cos\left(-\frac{\pi}{6}\right) = \frac{\sqrt{3}}{2}$ ;  $\tan\left(-\frac{\pi}{6}\right) = -\frac{\sqrt{3}}{3}$ ;  $\csc\left(-\frac{\pi}{6}\right) = -2$ ;  $\sec\left(-\frac{\pi}{6}\right) = \frac{2\sqrt{3}}{3}$ ;  $\cot\left(-\frac{\pi}{6}\right) = -\sqrt{3}$
42.  $\sin\left(-\frac{\pi}{3}\right) = -\frac{\sqrt{3}}{2}$ ;  $\cos\left(-\frac{\pi}{3}\right) = \frac{1}{2}$ ;  $\tan\left(-\frac{\pi}{3}\right) = -\sqrt{3}$ ;  $\csc\left(-\frac{\pi}{3}\right) = -\frac{2\sqrt{3}}{3}$ ;  $\sec\left(-\frac{\pi}{3}\right) = 2$ ;  $\cot\left(-\frac{\pi}{3}\right) = -\frac{\sqrt{3}}{3}$
43.  $\sin(-45^\circ) = -\frac{\sqrt{2}}{2}$ ;  $\cos(-45^\circ) = \frac{\sqrt{2}}{2}$ ;  $\tan(-45^\circ) = -1$ ;  $\csc(-45^\circ) = -\sqrt{2}$ ;  $\sec(-45^\circ) = \sqrt{2}$ ;  $\cot(-45^\circ) = -1$
44.  $\sin(-60^\circ) = -\frac{\sqrt{3}}{2}$ ;  $\cos(-60^\circ) = \frac{1}{2}$ ;  $\tan(-60^\circ) = -\sqrt{3}$ ;  $\csc(-60^\circ) = -\frac{2\sqrt{3}}{3}$ ;  $\sec(-60^\circ) = 2$ ;  $\cot(-60^\circ) = -\frac{\sqrt{3}}{3}$
45.  $\sin\left(\frac{5\pi}{2}\right) = 1$ ;  $\cos\left(\frac{5\pi}{2}\right) = 0$ ;  $\tan\left(\frac{5\pi}{2}\right)$  is not defined;  $\csc\left(\frac{5\pi}{2}\right) = 1$ ;  $\sec\left(\frac{5\pi}{2}\right)$  is not defined;  $\cot\left(\frac{5\pi}{2}\right) = 0$
46.  $\sin 3\pi = 0$ ;  $\cos 3\pi = -1$ ;  $\tan 3\pi = 0$ ;  $\csc 3\pi$  is not defined;  $\sec 3\pi = -1$ ;  $\cot 3\pi$  is not defined
47.  $\sin(-180^\circ) = 0$ ;  $\cos(-180^\circ) = -1$ ;  $\tan(-180^\circ) = 0$ ;  $\csc(-180^\circ)$  is not defined;  $\sec(-180^\circ) = -1$ ;  $\cot(-180^\circ)$  is not defined
48.  $\sin(-270^\circ) = 1$ ;  $\cos(-270^\circ) = 0$ ;  $\tan(-270^\circ)$  is not defined;  $\csc(-270^\circ) = 1$ ;  $\sec(-270^\circ)$  is not defined;  $\cot(-270^\circ) = 0$
49.  $\sin\left(-\frac{\pi}{2}\right) = -1$ ;  $\cos\left(-\frac{\pi}{2}\right) = 0$ ;  $\tan\left(-\frac{\pi}{2}\right)$  is not defined;  $\csc\left(-\frac{\pi}{2}\right) = -1$ ;  $\sec\left(-\frac{\pi}{2}\right)$  is not defined;  $\cot\left(-\frac{\pi}{2}\right) = 0$
50.  $\sin(-5\pi) = 0$ ;  $\cos(-5\pi) = -1$ ;  $\tan(-5\pi) = 0$ ;  $\csc(-5\pi)$  is not defined;  $\sec(-5\pi) = -1$ ;  $\cot(-5\pi)$  is not defined
51.  $\sin 480^\circ = \frac{\sqrt{3}}{2}$ ;  $\cos 480^\circ = -\frac{1}{2}$ ;  $\tan 480^\circ = -\sqrt{3}$ ;  $\csc 480^\circ = \frac{2\sqrt{3}}{3}$ ;  $\sec 480^\circ = -2$ ;  $\cot 480^\circ = -\frac{\sqrt{3}}{3}$
52.  $\sin(-150^\circ) = -\frac{1}{2}$ ;  $\cos(-150^\circ) = -\frac{\sqrt{3}}{2}$ ;  $\tan(-150^\circ) = \frac{\sqrt{3}}{3}$ ;  $\csc(-150^\circ) = -2$ ;  $\sec(-150^\circ) = -\frac{2\sqrt{3}}{3}$ ;  $\cot(-150^\circ) = \sqrt{3}$