

**Point  $P$  is located at the intersection of a circle with a radius of  $r$  and the terminal side of angle  $\vartheta$ . Find the exact coordinates of point  $P$ . Show your work clearly!**

1.  $\vartheta = 30^\circ, r = 5$

2.  $\vartheta = 135^\circ, r = 9$

3.  $\vartheta = 180^\circ, r = 45$

4.  $\vartheta = -135^\circ, r = 7.6$

**Find each trigonometric function value. Give exact answers. Show your work!!**

5.  $\sin 135^\circ$

6.  $\tan 150^\circ$

7.  $\cos 210^\circ$

8.  $\sin 300^\circ$

9.  $\tan 330^\circ$

10.  $\cos 0^\circ$

11.  $\sin 90^\circ$

12.  $\tan 270^\circ$

13.  $\cos 180^\circ$

14.  $\sin(-90^\circ)$

15.  $\tan(-180^\circ)$

16.  $\cos 1080^\circ$

17.  $\sin 495^\circ$

18.  $\cos(-135^\circ)$

19.  $\sin(-405^\circ)$

20.  $\tan(-30^\circ)$

21.  $\cos 810^\circ$

22.  $\tan 780^\circ$

23.  $\sec 120^\circ$

24.  $\csc(-660^\circ)$

25.  $\cot(-765^\circ)$

26.  $\csc 1140^\circ$

**Answers:** 1.  $P\left(\frac{5\sqrt{3}}{2}, \frac{5}{2}\right)$ , 2.  $P\left(-\frac{9\sqrt{2}}{2}, \frac{9\sqrt{2}}{2}\right)$ , 3.  $P(-45, 0)$ , 4.  $P\left(-\frac{19\sqrt{2}}{5}, -\frac{19\sqrt{2}}{5}\right)$ , 5.  $\frac{\sqrt{2}}{2}$ , 6.  $-\frac{\sqrt{3}}{3}$ , 7.  $-\frac{\sqrt{3}}{2}$ , 8.  $-\frac{\sqrt{3}}{2}$ , 9.  $-\frac{\sqrt{3}}{3}$ , 10. 1, 11. 1, 12. und, 13. -1, 14. -1, 15. 0, 16. 1, 17.  $\frac{\sqrt{2}}{2}$ , 18.  $-\frac{\sqrt{2}}{2}$ , 19.  $-\frac{\sqrt{2}}{2}$ , 20.  $-\frac{\sqrt{3}}{3}$ , 21. 0, 22.  $\sqrt{3}$ , 23. -2, 24.  $\frac{2\sqrt{3}}{3}$ , 25. -1, 26.  $\frac{2\sqrt{3}}{3}$