

## Trigonometric Functions of Any Angle

Date \_\_\_\_\_

Use the given point on the terminal side of angle  $\theta$  to find the value of the trigonometric function indicated.

1)  $\tan \theta; (3, 4)$

2)  $\sec \theta; (-2, -2\sqrt{3})$

3)  $\cos \theta; (2, -\sqrt{5})$

4)  $\cot \theta; (-\sqrt{17}, 8)$

5)  $\sin \theta; (\sqrt{13}, -6)$

6)  $\csc \theta; (-4, -2\sqrt{5})$

Find the exact value of each trigonometric function.

7)  $\sin -\frac{3\pi}{2}$

8)  $\csc -\frac{\pi}{4}$

9)  $\cos -\frac{7\pi}{6}$

10)  $\cot \frac{4\pi}{3}$

11)  $\tan -\frac{\pi}{6}$

12)  $\sec -\frac{5\pi}{3}$

State the quadrant in which  $\theta$  lies.

13)  $\sin \theta < 0$  and  $\cos \theta < 0$

14)  $\sin \theta > 0$  and  $\cos \theta > 0$

15)  $\sin\theta > 0$  and  $\tan\theta < 0$

16)  $\sec\theta > 0$  and  $\cot\theta < 0$

**Find the values of the six trigonometric functions of  $\theta$  given the constraint on the angle.**

17)  $\sin\theta = \frac{3}{5}$ ;  $\theta$  lies in Quadrant II.

18)  $\tan\theta = -\frac{15}{8}$ ;  $\sin\theta < 0$ .

19)  $\cot\theta = -3$ ;  $\cos\theta > 0$ .

20)  $\sin\theta = 0$ ;  $\sec\theta = -1$ .

**Solve each equation for  $0 \leq \theta < 2\pi$ .**

21)  $-\frac{\sqrt{3}}{2} = \cos\theta$

22)  $-\frac{1}{2} = \sin\theta$

23)  $\tan\theta = 0$

24)  $\sin\theta = 0$

**Evaluate without using a calculator. Keep in mind the domain of the inverse function.**

25)  $\sin^{-1}\frac{1}{2}$

26)  $\cos^{-1}\frac{1}{2}$

27)  $\tan^{-1}\frac{\sqrt{3}}{3}$

28)  $\tan^{-1}-\sqrt{3}$

29)  $\sin^{-1}\frac{\sqrt{3}}{2}$

30)  $\cos^{-1}-\frac{1}{2}$

## Answers to Trigonometric Functions of Any Angle (ID: 1)

1)  $\frac{4}{3}$

2)  $-2$

3)  $\frac{2}{3}$

4)  $-\frac{\sqrt{17}}{8}$

5)  $-\frac{6}{7}$

6)  $-\frac{3\sqrt{5}}{5}$

7)  $1$

8)  $-\sqrt{2}$

9)  $-\frac{\sqrt{3}}{2}$

10)  $\frac{\sqrt{3}}{3}$

11)  $-\frac{\sqrt{3}}{3}$

12)  $2$

13)  $\text{III}$

14)  $\text{I}$

15)  $\text{II}$

16)  $\text{II}$

17)  $\cos\theta = -\frac{4}{5}; \tan\theta = -\frac{3}{4}; \csc\theta = \frac{5}{3}; \sec\theta = -\frac{5}{4}; \cot\theta = -\frac{4}{3}$

18)  $\sin\theta = -\frac{15}{17}; \cos\theta = \frac{8}{17}; \tan\theta = -\frac{15}{8}; \csc\theta = -\frac{17}{15}; \sec\theta = \frac{17}{8}; \cot\theta = -\frac{8}{15}$

19)  $\sin\theta = -\frac{\sqrt{10}}{10}; \cos\theta = 3 \cdot \frac{\sqrt{10}}{10}; \tan\theta = -\frac{1}{3}; \csc\theta = -\sqrt{10}; \sec\theta = \frac{\sqrt{10}}{3}; \cot\theta = -3$

20)  $\sin\theta = 0; \cos\theta = -1; \tan\theta = 0; \csc\theta$  is undefined;  $\sec\theta = -1; \cot\theta$  is undefined

21)  $\left\{ \frac{5\pi}{6}, \frac{7\pi}{6} \right\}$

22)  $\left\{ \frac{7\pi}{6}, \frac{11\pi}{6} \right\}$

23)  $\{0, \pi\}$

24)  $\{0, \pi\}$

25)  $\frac{\pi}{6}$

26)  $\frac{\pi}{3}$

27)  $\frac{\pi}{6}$

28)  $-\frac{\pi}{3}$

29)  $\frac{\pi}{3}$

30)  $\frac{2\pi}{3}$