
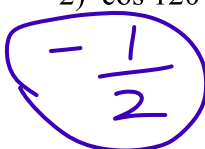




Trigonometric Functions Notes

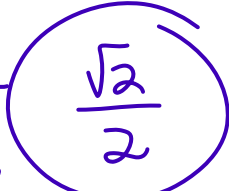
Find the exact value of each trigonometric function.

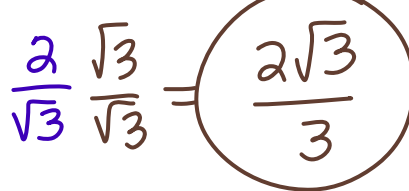
1) $\sin -30^\circ$ (30° ref \angle)

 $-\frac{1}{2}$

2) $\cos 120^\circ$ (60° ref \angle)

 $-\frac{1}{2}$

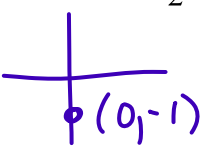
3) $\tan \frac{23\pi}{6}$

 ref $\angle = \frac{\pi}{6}$ and 3rd Q
 $\frac{-1/2}{\sqrt{3}/2} = -\frac{1}{\sqrt{3}} = -\frac{\sqrt{3}}{3}$

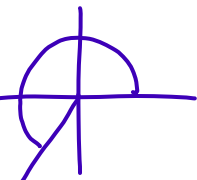
4) $\tan -\frac{2\pi}{3}$

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


5) $\sin 855^\circ$
 $\frac{855 - 720}{\sin 135^\circ}$

 Q2 y-value
 $\frac{\sqrt{2}}{2}$

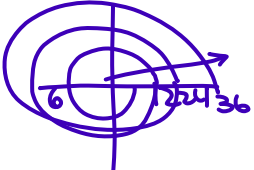
6) $\sec 690^\circ$
 $\frac{690 - 360}{\sec 330^\circ}$ (Q4, ref $\angle 30^\circ$)

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

7) $\csc 180^\circ$
 undefined

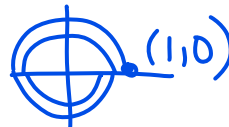
8) $\csc 30^\circ$
 2
 9) $\cot -\frac{\pi}{2}$

 $\frac{0}{-1} = 0$

9) $\cos \frac{4\pi}{3}$

 $-\frac{1}{2}$

12) $\tan \frac{21\pi}{4}$

 1

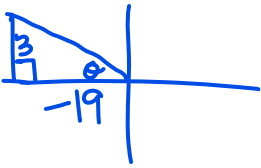
11) $\sec -\frac{35\pi}{6}$

 $\cos(\frac{\pi}{6}) = \frac{\sqrt{3}}{2}$
 $\sec(\frac{\pi}{6}) = \frac{2}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$

13) $\csc \frac{5\pi}{4}$
 $\frac{2}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{2\sqrt{2}}{2} = \sqrt{2}$
 $-\frac{2\sqrt{2}}{2} = -\sqrt{2}$

14) $\cot -4\pi$

 $\frac{1}{0}$ undefined

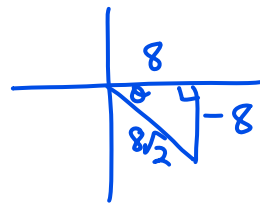
Use the given point on the terminal side of angle θ to find the value of the trigonometric function indicated.

15) $\cot \theta; (-19, 3)$



$$\cot \theta = \frac{-19}{3}$$

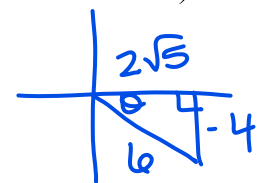
16) $\sec \theta; (8, -8)$



$$\sec \theta = \frac{8\sqrt{2}}{8} = \sqrt{2}$$

$$\begin{aligned} 8^2 + (-8)^2 &= c^2 \\ 64 + 64 &= c^2 \\ \sqrt{64 \cdot 2} &= \sqrt{c^2} \\ 8\sqrt{2} &= c \end{aligned}$$

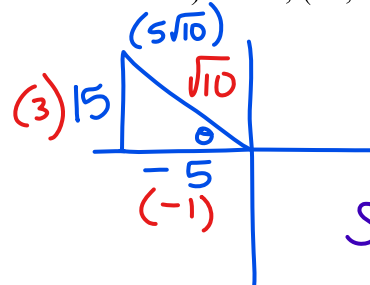
17) $\csc \theta; (2\sqrt{5}, -4)$



$$\begin{aligned} (2\sqrt{5})^2 + (-4)^2 &= c^2 \\ 4 \cdot 5 + 16 &= c^2 \\ \sqrt{36} &= \sqrt{c^2} \\ 6 &= c \end{aligned}$$

$$\csc \theta = \frac{6}{-4} = -\frac{3}{2}$$

18) $\sin \theta; (-5, 15)$



$$\begin{aligned} 3^2 + (-1)^2 &= c^2 \\ 10 &= c^2 \quad c = \sqrt{10} \end{aligned}$$

$$\sin \theta = \frac{3\sqrt{10}}{\sqrt{10}\sqrt{10}} = \frac{3\sqrt{10}}{10}$$

Write the first expression in terms of the second if the terminal point determined by θ is in the given quadrant.

19) $\cos \theta, \sin \theta$; quadrant IV

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

$$\cos^2 \theta = 1 - \sin^2 \theta$$

$$\cos \theta = \sqrt{1 - \sin^2 \theta}$$

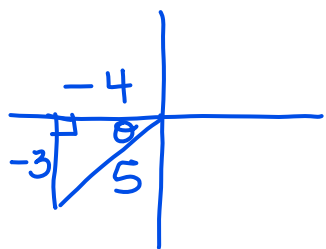
20) $\tan \theta, \cos \theta$; quadrant II

$$\tan \theta = \frac{\sin \theta}{\cos \theta}$$

$$\tan \theta = \frac{\sqrt{1 - \cos^2 \theta}}{\cos \theta}$$

Find the values of the trigonometric functions of θ from the given information.

21) $\cos \theta = -\frac{4}{5}$; terminal point of θ is in quadrant III



$$\csc \theta = -\frac{5}{3}$$

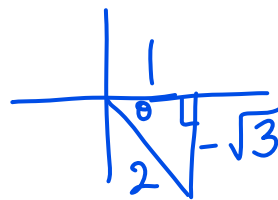
$$\sec \theta = -\frac{5}{4}$$

$$\sin \theta = -\frac{3}{5}$$

$$\tan \theta = \frac{3}{4}$$

$$\cot \theta = \frac{4}{3}$$

22) $\sec \theta = 2$; $\sin \theta < 0$



$$\cos \theta = \frac{1}{2}$$

$$\tan \theta = -\sqrt{3}$$

$$\sin \theta = -\frac{\sqrt{3}}{2}$$

$$\csc \theta = -\frac{2\sqrt{3}}{3}$$

$$\cot \theta = -\frac{\sqrt{3}}{3}$$