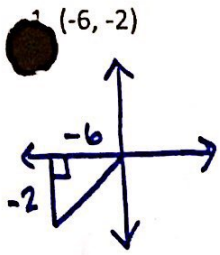


The given point lies on the terminal side of an angle  $\theta$  in standard position. Find the values of all six trigonometric functions.



$$(-6)^2 + (-2)^2 = r^2$$

$$\sqrt{40} = \sqrt{r^2}$$

$$2\sqrt{10} = r$$

$$x = -6$$

$$y = -2$$

$$r = 2\sqrt{10}$$

$$\frac{y}{r} \sin \theta = \frac{-2}{2\sqrt{10}} = \frac{-\sqrt{10}}{10}$$

$$\frac{r}{y} \csc \theta = \frac{2\sqrt{10}}{-2} = -\sqrt{10}$$

$$\frac{x}{r} \cos \theta = \frac{-6}{2\sqrt{10}} = \frac{-3\sqrt{10}}{10}$$

$$\frac{r}{x} \sec \theta = \frac{2\sqrt{10}}{-6} = \frac{-\sqrt{10}}{3}$$

$$\frac{y}{x} \tan \theta = \frac{-2}{-6} = \frac{1}{3}$$

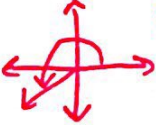
$$\frac{x}{y} \cot \theta = \frac{-6}{-2} = 3$$

$$\frac{y}{x} \tan \theta = \frac{-2}{-6} = \frac{1}{3}$$

$$\frac{x}{y} \cot \theta = \frac{-6}{-2} = 3$$

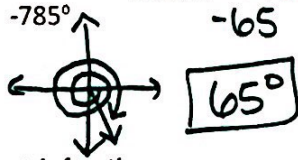
Find the reference angle for each of the following angles. (Give degrees in degrees, radians in radians).

2.  $215^\circ$



$$215 - 180 = 35^\circ$$

3.  $-785^\circ$

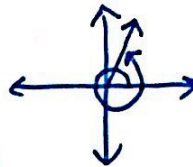


$$-785 + 360 + 360 = -65$$

4.  $\frac{12\pi}{5}$

$$\frac{12\pi}{5} \cdot \frac{180}{\pi} = 432$$

$$432 - 360 = 72$$

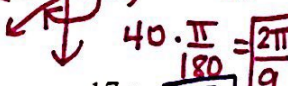


$$72 \cdot \frac{\pi}{180} = \frac{2\pi}{5}$$

5.  $-\frac{7\pi}{9}$

$$-\frac{7\pi}{9} \cdot \frac{180}{\pi} = -140$$

$$-180 - (-140) = -40$$



$$40 \cdot \frac{\pi}{180} = \frac{2\pi}{9}$$

Find the exact value of each trigonometric function.

6.  $\csc \frac{11\pi}{3} = \frac{-2\sqrt{3}}{3}$

$$\sin \frac{11\pi}{3} = -\frac{\sqrt{3}}{2} \text{ flip}$$

7.  $\cot 2\pi = \text{undefined}$

$$\tan 2\pi = \frac{0}{1}$$

$$\cot 2\pi = \frac{1}{0}$$

8.  $\tan(-1470^\circ) = \frac{-\sqrt{3}}{3}$

$$-1470 + 360 + 360 + 360 + 360 + 360 = 330$$

$$\tan 330 = \frac{-1}{\sqrt{3}} = \frac{-\sqrt{3}}{3}$$

9.  $\cos \frac{17\pi}{6} = \frac{-\sqrt{3}}{2}$

$$\frac{17\pi}{6} \cdot \frac{180}{\pi} = 510$$

$$510 - 360 = 150$$

Find a positive and a negative angle co-terminal with the given angle. (Give degrees in degrees and radians in exact radians.)

10.  $-187^\circ$

$$-187 + 360 = 173^\circ$$

$$-187 - 360 = -547^\circ$$

11.  $852^\circ$

$$852 - 360 = 492^\circ$$

$$852 - 360 - 360 - 360 = -228^\circ$$

12.  $\frac{13\pi}{22}$

$$\frac{13\pi}{22} + 2\pi = \frac{57\pi}{22}$$

$$\frac{13\pi}{22} - 2\pi = \frac{-31\pi}{22}$$

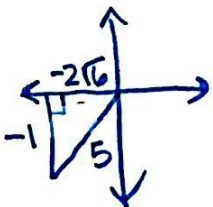
13.  $-\frac{17\pi}{4}$

$$-\frac{17\pi}{4} + 2\pi = \frac{-9\pi}{4}$$

$$-\frac{17\pi}{4} + 2\pi + 2\pi + 2\pi = \frac{7\pi}{4}$$

14. Find the exact value of all six trigonometric functions given the following:

$$\sin \theta = \frac{-1}{5} \text{ and } \cos \theta < 0 \text{ Quadrant III}$$



$$x^2 + (-1)^2 = (5)^2$$

$$x^2 + 1 = 25$$

$$\sqrt{x^2} = \sqrt{24}$$

$$x = -2\sqrt{6}$$

$$y = -1$$

$$r = 5$$

$$\frac{y}{r} \sin \theta = \frac{-1}{5}$$

$$\frac{r}{y} \csc \theta = -5$$

$$\frac{x}{r} \cos \theta = \frac{-2\sqrt{6}}{5}$$

$$\frac{r}{x} \sec \theta = \frac{-5\sqrt{6}}{12}$$

$$\frac{5 \cdot \sqrt{6}}{-2\sqrt{6} \cdot \sqrt{6}} = \frac{-5\sqrt{6}}{12}$$

$$\frac{y}{x} \tan \theta = \frac{-1}{-2\sqrt{6}} = \frac{\sqrt{6}}{12}$$

$$\cot \theta = 2\sqrt{6}$$

$$\frac{y}{x} \tan \theta = \frac{-1}{-2\sqrt{6}} = \frac{\sqrt{6}}{12}$$

$$\frac{2\sqrt{6}}{1}$$