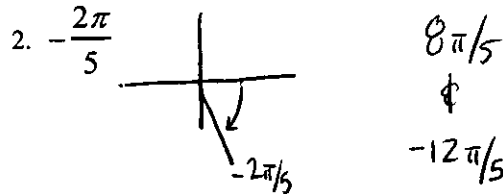
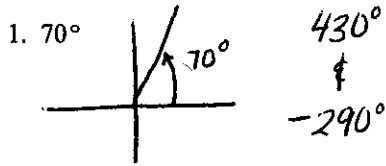


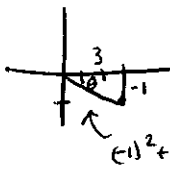
email me mistakes if
you find any.

Non-Graphing Calculator

Sketch the angle. Find one positive angle and one negative angle that are coterminal with each angle.



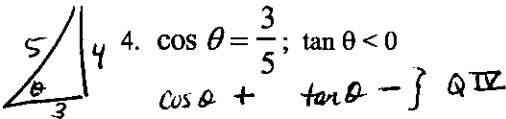
3. Given the point $P(3, -1)$. Find the values of the six trigonometric functions of an angle in standard position if the given point lies on its terminal side.



$$\sin \theta = \frac{-1}{\sqrt{10}} \quad \cos \theta = \frac{3}{\sqrt{10}} \quad \tan \theta = -\frac{1}{3}$$

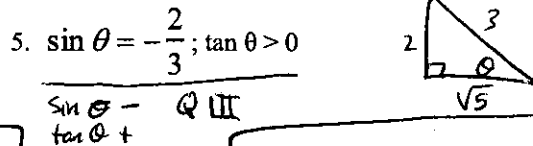
$$\csc \theta = -\sqrt{10} \quad \sec \theta = \frac{\sqrt{10}}{3} \quad \cot \theta = -3$$

For questions 4 and 5, find the values of the remaining five trigonometric functions of θ .



$$\sin \theta = \frac{4}{5} \quad \sec \theta = \frac{5}{3} \quad \tan \theta = -\frac{4}{3}$$

$$\csc \theta = \frac{5}{4} \quad \cot \theta = -\frac{3}{4}$$



$$\csc \theta = -\frac{3}{2} \quad \cos \theta = -\frac{\sqrt{5}}{3} \quad \tan \theta = \frac{2}{\sqrt{5}}$$

$$\sec \theta = -\frac{3}{\sqrt{5}} \quad \cot \theta = \frac{\sqrt{5}}{2}$$

For questions 6 - 15, find each exact value.

6. $\sin\left(\frac{5\pi}{6}\right) = \frac{1}{2}$

30° Ref 4
Q II

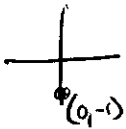
7. $\cos\left(\frac{5\pi}{4}\right) = \frac{-1}{\sqrt{2}} \text{ or } -\frac{\sqrt{2}}{2}$

45° Ref 4
Q III

8. $\tan\left(-\frac{3\pi}{4}\right) = 1$

45° Ref 4
Q III

9. $\csc 270^\circ = \frac{1}{\sin 270^\circ} = \frac{1}{-1} = -1$



10. $\cos\left(-\frac{11\pi}{6}\right) = \frac{\sqrt{3}}{2}$

30° Ref 4
Q I

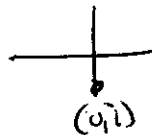
11. $\tan\left(-\frac{5\pi}{3}\right) = \sqrt{3}$

60° Ref 4
Q I

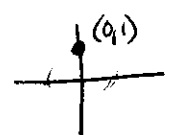
12. $\cos 180^\circ = -1$



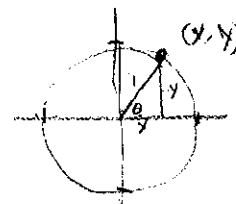
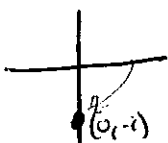
13. $\tan\left(\frac{3\pi}{2}\right) = \frac{\sin \frac{3\pi}{2}}{\cos \frac{3\pi}{2}} = \frac{-1}{0} = \text{undefined}$



14. $\cos\left(-\frac{7\pi}{2}\right) = 0$



15. $\cot(-90^\circ) = \frac{\cos(-90^\circ)}{\sin(-90^\circ)} = \frac{0}{-1} = 0$



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

Graphing Calculator

2nd Apps (it's the "Angle" button)

16. Convert from DMS to decimal form: $38^{\circ}23'36''$
on calculator ~~38~~

Alpha $\boxed{38.393^{\circ}}$

17. Convert from decimal form to degrees: 59.354° .

use \blacktriangleright DMS (under "Angle")

$\boxed{59^{\circ}21'14.4''}$

18. The radius of a car wheel is 15 inches. How many revolutions per minute is the wheel making when the car is traveling at 60 mph.

$$\frac{60 \text{ mi}}{\text{hr}} \cdot \frac{1 \text{ hr}}{60 \text{ min}} \cdot \frac{5280 \text{ ft}}{1 \text{ mi}} \cdot \frac{12 \text{ in}}{1 \text{ ft}} \cdot \frac{1 \text{ rev}}{30\pi \text{ in}} = \frac{(60)(5280)(12)}{(60)(30\pi)} \approx 672.27 \frac{\text{rev}}{\text{min}}$$

Circumference of wheel = 1 Revolution

Evaluate using a calculator.

19. $\sin 47^{\circ} \approx .731$

20. $\csc\left(\frac{\pi}{10}\right) = \frac{1}{\sin(\pi/10)} \approx 3.236$

21. Given $\theta = -145^{\circ}$. Change to radian measure in terms of π .

$-145^{\circ} \cdot \frac{\pi}{180^{\circ}} = -\frac{145\pi}{180} = \boxed{-\frac{29\pi}{36}}$

22. Given $\theta = -1$ radian. Change to degree measure.

$-1 \cdot \frac{180^{\circ}}{\pi} = -\frac{180}{\pi} \approx \boxed{-57.296^{\circ}}$

For questions 23 and 24, find the measure of the intercepted arc in terms of π in a circle of diameter 30 inches with the given central angle.

arc length $\rightarrow s = \theta \cdot r$

\leftarrow MUST BE IN RADIAN!

23. $\frac{\pi}{24}$

$s = \frac{\pi}{24} \cdot 15 = \boxed{\frac{5\pi}{8} \text{ inches}}$

24. 110°

$110^{\circ} \cdot \frac{\pi}{180} = \boxed{\frac{11\pi}{18}}$

central θ

$s = \frac{11\pi}{18} \cdot 15 = \boxed{\frac{55\pi}{6} \text{ inches}}$

25. The measure of an arc is 10 cm. Find the degree measure to the nearest tenth of the central angle it subtends in a circle of radius 16 cm.

$s = 10 \text{ cm}$

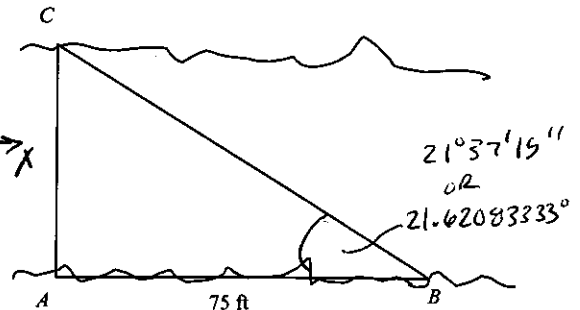
$10 = \theta \cdot 16$

$\theta = \frac{5}{8} \text{ radians} \Rightarrow \frac{5}{8} \cdot \frac{180}{\pi} \approx \boxed{35.8^{\circ}}$

$\frac{10}{16} = \theta$

26. To measure the width of a river, a surveyor starts at point A on one bank and walks 75 feet down the river to point B. He then measures the angle ABC to be $21^{\circ}37'15''$. Estimate the width of the river to the nearest foot.

21.62083333°



$\tan(21^{\circ}37'15'') = \frac{x}{75}$

$75 \tan(21^{\circ}37'15'') = x \Rightarrow x \approx 29.726 \text{ ft}$

to the nearest foot $\boxed{30 \text{ ft}}$