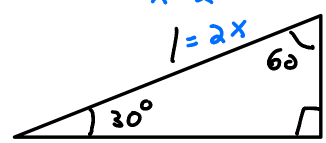
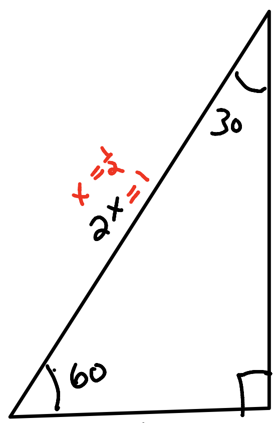
Period 4, Dec 5, 2024

Rationalize the denominator

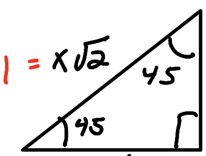
$$\sqrt{\frac{x^2}{5}} = \frac{\sqrt{x^2}}{\sqrt{5}} = \frac{|x|\sqrt{5}}{\sqrt{5}\cdot\sqrt{5}} = \frac{\pm x\sqrt{5}}{5}$$

Unit circle
radius = 1

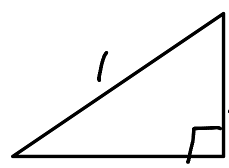




$$\frac{1}{\sqrt{2}} = \frac{x\sqrt{2}}{\sqrt{2}} \Rightarrow \frac{\sqrt{2}}{\sqrt{2}}\cdot\frac{1}{\sqrt{2}} = x \Rightarrow \frac{\sqrt{2}}{2} = x$$



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



$\Rightarrow x^2 + y^2 = 1$

$\frac{\sqrt{2}}{2} = .707$

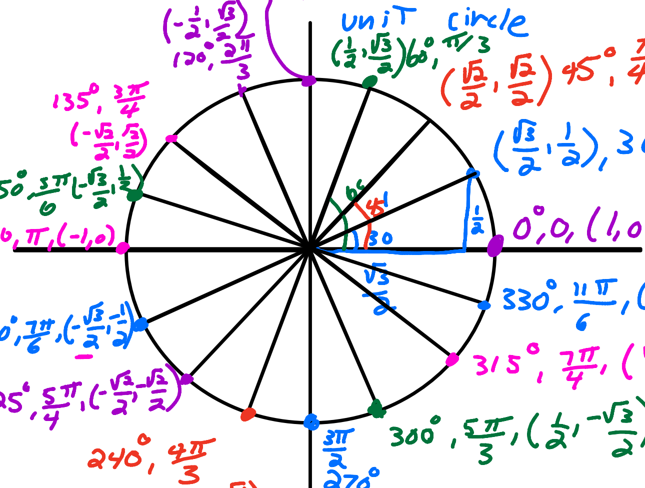
$\frac{\sqrt{3}}{2} = 0.866$

$\frac{1}{2} = .5$

$(\overset{x}{\cos\theta}, \overset{y}{\sin\theta})$

$\sin 60° = .866 = \frac{\sqrt{3}}{2}$

$\cos 45° = .707 = \frac{\sqrt{2}}{2}$



$\sin 330° = -\frac{1}{2}$

$\cos 210° = -\frac{\sqrt{3}}{2}$

$$\tan 30° = \frac{\sin 30°}{\cos 30°} = \frac{\frac{1}{2}}{\sqrt{3}/2} = \frac{1}{\cancel{2}}\cdot\frac{\cancel{2}}{\sqrt{3}} = \frac{1\cdot\sqrt{3}}{\sqrt{3}\cdot\sqrt{3}} = \frac{\sqrt{3}}{3}$$

$$\frac{\sin^2\theta+\cos^2\theta=1}{\cos^2\theta \qquad \cos^2\theta}$$

$$\frac{\sin^2\theta}{\cos^2\theta}+\frac{\cos^2\theta}{\cos^2\theta}=\frac{1}{\cos^2\theta}$$

$$\tan^2\theta+1=\sec^2\theta$$

$$\frac{\sin^2\theta+\cos^2\theta=1}{\sin^2\theta \qquad \sin^2\theta}$$

$$\frac{\sin^2\theta}{\sin^2\theta}+\frac{\cos^2\theta}{\sin^2\theta}=\frac{1}{\sin^2\theta}$$

$$1+\cot^2\theta=\csc^2\theta$$

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

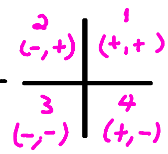
$$\cot\theta=\frac{1}{\tan\theta}=\frac{\cos\theta}{\sin\theta}$$

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

$$\csc\theta=\frac{1}{\sin\theta}$$

$(\cos\theta, \sin\theta)$

θ is in Quad #4



$\sin\theta = -$

$$\cos\theta=\frac{5}{13}$$

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

$$\sin^2\theta+\left(\frac{5}{13}\right)^2=1$$

$$\sin^2\theta+\frac{25}{169}=\frac{169}{169}$$

$$-\frac{25}{169} \qquad -\frac{25}{169}$$

$$\sqrt{\sin^2\theta}=\sqrt{\frac{144}{169}}=\pm\frac{12}{13}$$

$$\sin\theta=\pm\frac{12}{13}$$

$$\sin\theta=-\frac{12}{13}$$

$$\sin\theta=-\frac{12}{13}$$

$$\csc\theta=-\frac{13}{12}$$

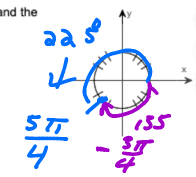
$$\cot\theta=-5/12$$

$$\tan\theta=-\frac{12}{5}$$

$$\sec\theta=\frac{13}{5}$$

$$\tan\theta=\frac{\sin\theta}{\cos\theta}=\frac{\frac{-12}{13}}{\frac{5}{13}}=\frac{-12}{\cancel{13}}\cdot\frac{\cancel{13}}{5}=-\frac{12}{5}$$

Use the circle shown in the rectangular coordinate system to find two angles, in radians, between -2π and 2π such that each angle's terminal side passes through the origin and the point indicated on the circle.

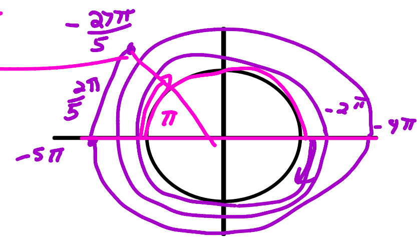


The two angles that determine the indicated point on the circle are $\square$. $\frac{5\pi}{4}, -\frac{3\pi}{4}$
(Simplify your anwers. Type exact answers in terms of π. Use integers or fractions for any numbers in the expressions. Use a comma to separate answers as needed.)

$\pi - \frac{2}{5}\pi = \frac{5\pi}{5} - \frac{2\pi}{5} = \frac{3\pi}{5}$

Find a positive angle less than 2π that is coterminal with the given angle.

$-\frac{27\pi}{5} = -5\frac{2}{5}\pi = -5\frac{2}{5}\pi$

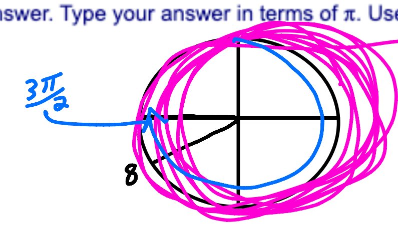


A positive angle less than 2π that is coterminal with $-\frac{27\pi}{5}$ is $\square$. $\frac{3\pi}{5}$
(Simplify your answer. Type your answer in terms of π. Use integers or fractions for any numbers in the expression.)

Find the positive radian measure of the angle that the second hand of a clock moves through in the given time.

8 minutes and 45 seconds

In 8 minutes and 45 seconds the second hand of a clock passes through an angle that measures $\square$ radians.
(Simplify your answer. Type your answer in terms of π. Use integers or fractions for any numbers in the expression.)



$8(2\pi) = 16\pi = 8$ min

$16\pi + \frac{3\pi}{2} = 17\frac{1}{2}\pi$

The minute hand of a clock moves from 12 to 5 o'clock, or $\frac{5}{12}$ of a complete revolution. Through how many degrees does it move? Through how many radians does it move?

The minute hand moves through 150 ° from 12 to 5 o'clock. $\Rightarrow$ $360 \cdot \frac{5}{12} = \frac{360 \cdot 5}{12} = \frac{\cancel{12} \cdot 30 \cdot 5}{\cancel{12}} = 150$

The minute hand moves through $\frac{5\pi}{6}$ radians from 12 to 5 o'clock.

(Type your answer in terms of π. Use integers or fractions for any numbers in the expression.)

$\frac{180}{150} = \frac{\pi}{X}$

$\frac{150\pi}{180} = \frac{\cancel{180}\,X}{\cancel{180}}$

$\frac{30 \cdot 5\pi}{30 \cdot 6} = X$

The angular speed of a point on a planet is $\frac{8\pi}{11}$ radian per hour. The equator lies on a circle of radius approximately 9000 miles. Find the linear velocity, in miles per hour, of a point on the equator.

The linear speed of a point on the equator is approximately 20563 miles per hour. $= \frac{8 \cdot 9000 \cdot \pi}{11}$ m/h

(Round to the nearest whole number as needed.)

Linear velocity $= \dfrac{\frac{8\pi}{11} \cdot 9000}{1 \text{ hour}} =$

The measure of an angle is given. Is this angle smaller or larger than a right angle?

$\theta = \frac{8}{7} = 1.14$ $\qquad \frac{\pi}{2} = 1.57$

Right > is Bigger.

Select the correct answer below and fill in the answer box to complete your choice.

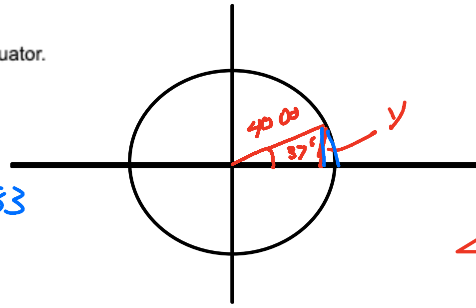
(Simplify your answer. Round to three decimal places as needed.)

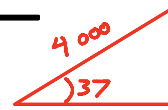
- A. The angle is larger than a right angle because $\frac{8}{7}$ is approximately ☐, which is greater than $\frac{\pi}{2} \approx$ ☐.
- B. The angle is smaller than a right angle because $\frac{8}{7}$ is approximately 1.143, which is less than $\frac{\pi}{2} \approx$ 1.571.

Assuming Earth to be a sphere of radius 4000 miles, how many miles north of the Equator is City A, if it is 37° north from the Equator?

City A is approximately 2583 miles north of the Equator.
(Round to the nearest whole number as needed.)

$$\left(\frac{37}{360}\right)(2\cdot\pi\cdot 4000)=2583$$



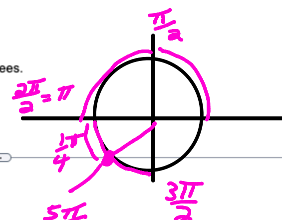


$= 4000\cdot\sin 37$

$=$.

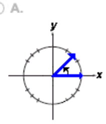
Draw the angle in standard position. State the quadrant in which the angle lies. Work the exercise without converting to degrees.

$\frac{5\pi}{4} = 1\frac{1}{4}\pi$

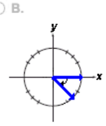


Choose the correct graph below.

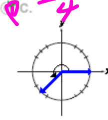
A.



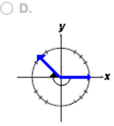
B.



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



D.



The angle is in quadrant III.