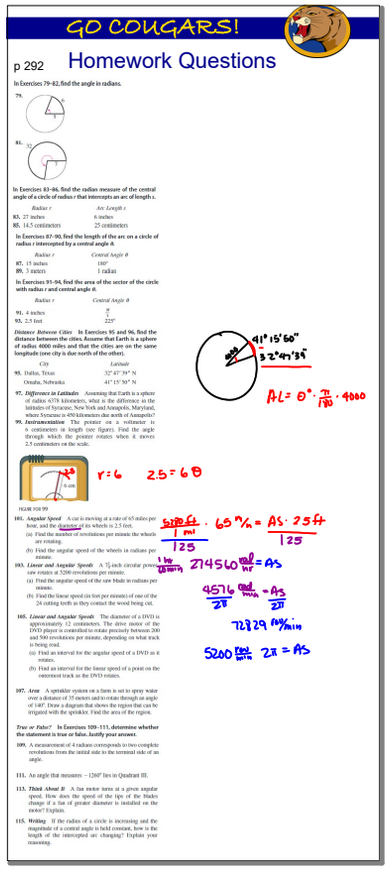


GO COUGARS!

p 292 Homework Questions

In Exercises 79–82, find the angle in radians.

79.

81.

In Exercises 83–86, find the radian measure of the central angle of a circle of radius r that intercepts an arc of length s.

	Radius r	Arc Length s
83.	27 inches	6 inches
85.	14.5 centimeters	25 centimeters

In Exercises 87–90, find the length of the arc on a circle of radius r intercepted by a central angle θ.

	Radius r	Central Angle θ
87.	15 inches	$180°$
89.	3 meters	1 radian

In Exercises 91–94, find the area of the sector of the circle with radius r and central angle θ.

	Radius r	Central Angle θ
91.	4 inches	$\frac{\pi}{4}$
93.	2.5 feet	$225°$

Distance Between Cities In Exercises 95 and 96, find the distance between the cities. Assume that Earth is a sphere of radius 4000 miles and that the cities are on the same longitude (one city is due north of the other).

	City	Latitude
95.	Dallas, Texas	32° 47' 39" N
	Omaha, Nebraska	41° 15' 50" N

97. *Difference in Latitudes* Assuming that Earth is a sphere of radius 6378 kilometers, what is the difference in the latitudes of Syracuse, New York and Annapolis, Maryland, where Syracuse is 456 kilometers due north of Annapolis?

99. *Instrumentation* The pointer on a voltmeter is 6 centimeters in length (see figure). Find the angle through which the pointer rotates when it moves 2.5 centimeters on the scale.

FIGURE FOR 99

101. *Angular Speed* A car is moving at a rate of 65 miles per hour, and the diameter of its wheels is 2.5 feet.
(a) Find the number of revolutions per minute the wheels are rotating.
(b) Find the angular speed of the wheels in radians per minute.

103. *Linear and Angular Speeds* A $\frac{5}{16}$-inch circular power saw rotates at 5200 revolutions per minute.
(a) Find the angular speed of the saw blade in radians per minute.
(b) Find the linear speed (in feet per minute) of one of the 24 cutting teeth as they contact the wood being cut.

105. *Linear and Angular Speeds* The diameter of a DVD is approximately 12 centimeters. The drive motor of the DVD player is controlled to rotate precisely between 200 and 500 revolutions per minute, depending on what track is being read.
(a) Find an interval for the angular speed of a DVD as it rotates.
(b) Find an interval for the linear speed of a point on the outermost track as the DVD rotates.

107. *Area* A sprinkler system on a farm is set to spray water over a distance of 35 meters and to rotate through an angle of 140°. Draw a diagram that shows the region that can be irrigated with the sprinkler. Find the area of the region.

True or False? In Exercises 109–111, determine whether the statement is true or false. Justify your answer.

109. A measurement of 4 radians corresponds to two complete revolutions from the initial side to the terminal side of an angle.

111. An angle that measures $-1260°$ lies in Quadrant III.

113. *Think About It* A fan motor turns at a given angular speed. How does the speed of the tips of the blades change if a fan of greater diameter is installed on the motor? Explain.

115. *Writing* If the radius of a circle is increasing and the magnitude of a central angle is held constant, how is the length of the intercepted arc changing? Explain your reasoning.

Feb 2-9:51 PM

4.3 Right Triangle Trig

SOH CAH TOA

Finding six trig ratios

Finding theta given a ratio

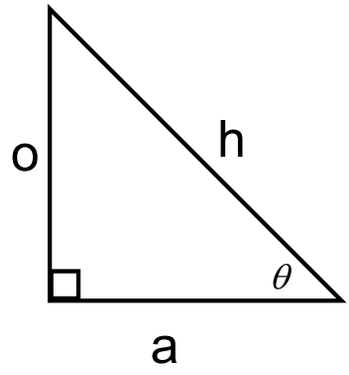
Mode of your calculator

Non-common trig ratios/values

Finding theta of non-common ratios/values

Angles of elevation and depression

Dec 20-8:31 AM



$\sin\theta =$ $\frac{o}{h}$

$\cos\theta =$ $\frac{a}{h}$

$\tan\theta =$ $\frac{o}{a}$

reciprocal functions

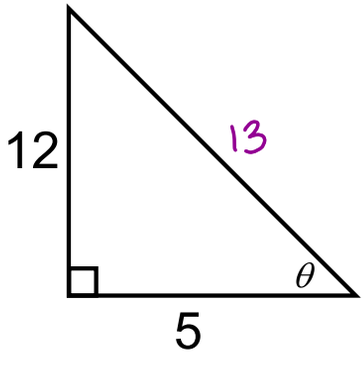
$\csc\theta =$ $\frac{1}{\sin\theta} = \frac{h}{o}$

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

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

What observation can you make about $\tan\theta$?

Dec 20-8:35 AM

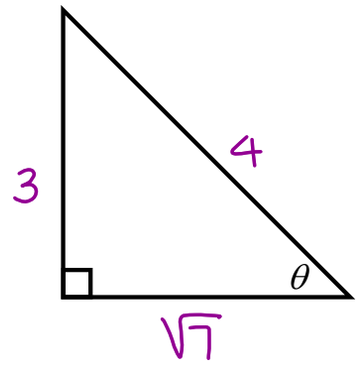


$\sin\theta =$ $\frac{12}{13}$ $\csc\theta =$ $\frac{13}{12}$

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

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

Dec 20-8:52 AM



Given $\sin\theta = \frac{3}{4}$,

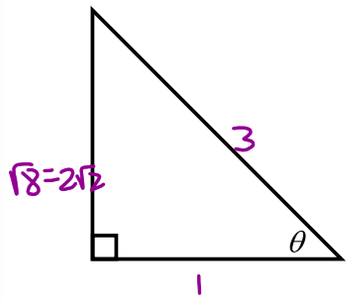
find the other 5 trig ratios

$\sin\theta = \frac{3}{4}$ $\quad \csc\theta = \frac{4}{3}$

$\cos\theta = \frac{\sqrt{7}}{4}$ $\quad \sec\theta = \frac{4}{\sqrt{7}}$

$\tan\theta = \frac{3}{\sqrt{7}} = \frac{3\sqrt{7}}{7}$ $\quad \cot\theta = \frac{\sqrt{7}}{3}$

Dec 20-8:59 AM



Given $\sec\theta = 3$,

find the other 5 trig ratios

$\cos\theta = \frac{1}{3}$

$\sin\theta = \frac{2\sqrt{2}}{3}$ $\quad \csc\theta = \frac{3}{2\sqrt{2}}$

$\cos\theta = \frac{1}{3}$ $\quad \sec\theta = 3$

$\tan\theta = 2\sqrt{2}$ $\quad \cot\theta = \frac{1}{2\sqrt{2}}$

Remember: $\tan\theta = \frac{\sin\theta}{\cos\theta}$ and $\cot\theta = \frac{\cos\theta}{\sin\theta}$

Dec 20-8:59 AM

Now let's work backwards!

Given $\sin\theta = \frac{1}{2}$, find θ

in degrees 30°

in radians $\frac{\pi}{6}$

Dec 20-9:30 AM

Finding approximate ratios/values for those not memorized from the unit circle

we use the calculator!

$\sin 41^\circ$ $= .6561$

$\tan 18^\circ 31' 52'' = .3352$

$\cos\frac{\pi}{5} = .8090$

$\sec 32^\circ = \frac{1}{\cos 32} = 1.1792$

$\cot 1.2 = \frac{1}{\tan 1.2}$ (in radians) $= .3888$

$\csc\frac{3\pi}{8} = \frac{1}{\sin\frac{3\pi}{8}} = 1.0824$

Dec 20-9:51 AM

Now find theta when given a ratio/value

Use your calculator to find $\sin\theta = .3214$ (.2314)

$0° < \theta < 90°$ (degrees) $\quad \sin^{-1}(.3214) \quad 0 < \theta < \frac{\pi}{2}$ (radians)

13.38° 0.23

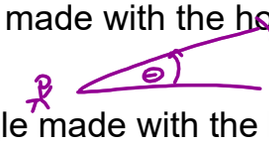
Dec 20-9:57 AM

More examples:

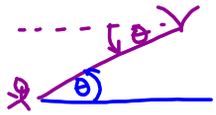
	in radians	in degrees
$\tan\theta = 1.2563$	.899 = .90	51.5
$\sec\theta = 1.3514$	.74	42.27°
$\frac{1}{\cos\theta} = 1.3514$, $\cos\theta = \frac{1}{1.3514} \rightarrow \cos^{-1}\left(\frac{1}{1.3514}\right)$		
$\csc\theta = 1.5826$	0.684	39.2°
$\sin^{-1}\left(\frac{1}{1.5826}\right)$		

Dec 20-10:03 AM

Angle of Elevation - the angle made with the horizon when you are looking up at something



Angle of Depression - the angle made with the horizon when you are looking down at something



Jan 9-2:16 PM

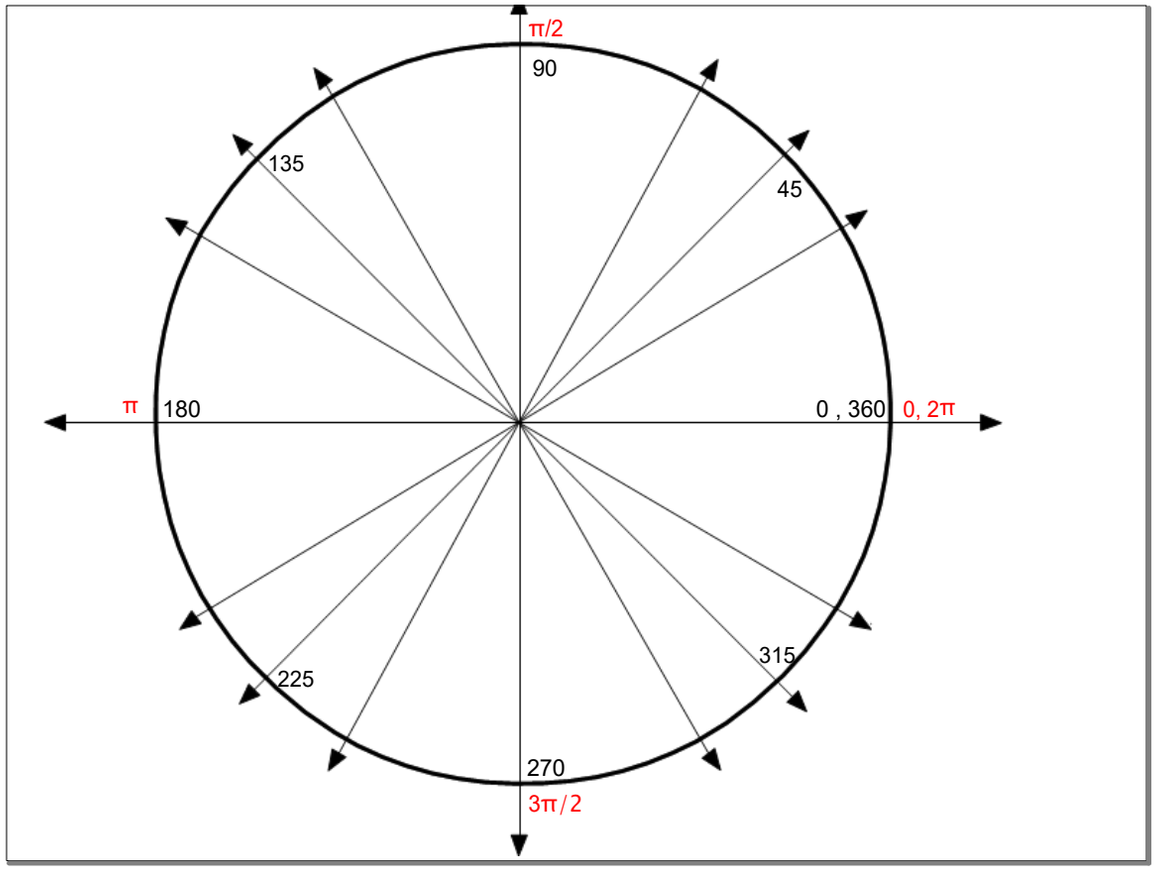
HOMEWORK

p 308 5, 9-25 odd, 51a, 53-58 all,

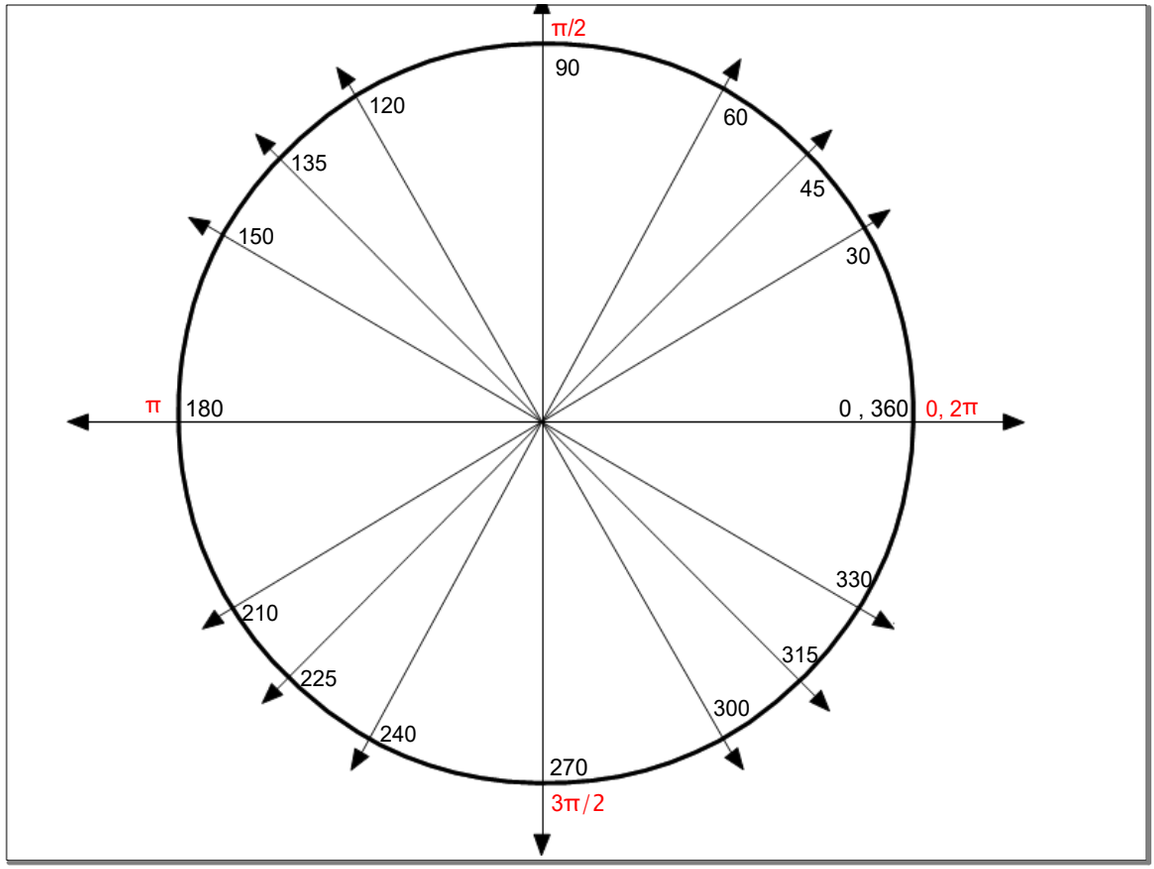
63, 67, 69

Workbook p 40 1-12

Aug 29-6:38 AM



Jan 7-4:16 PM



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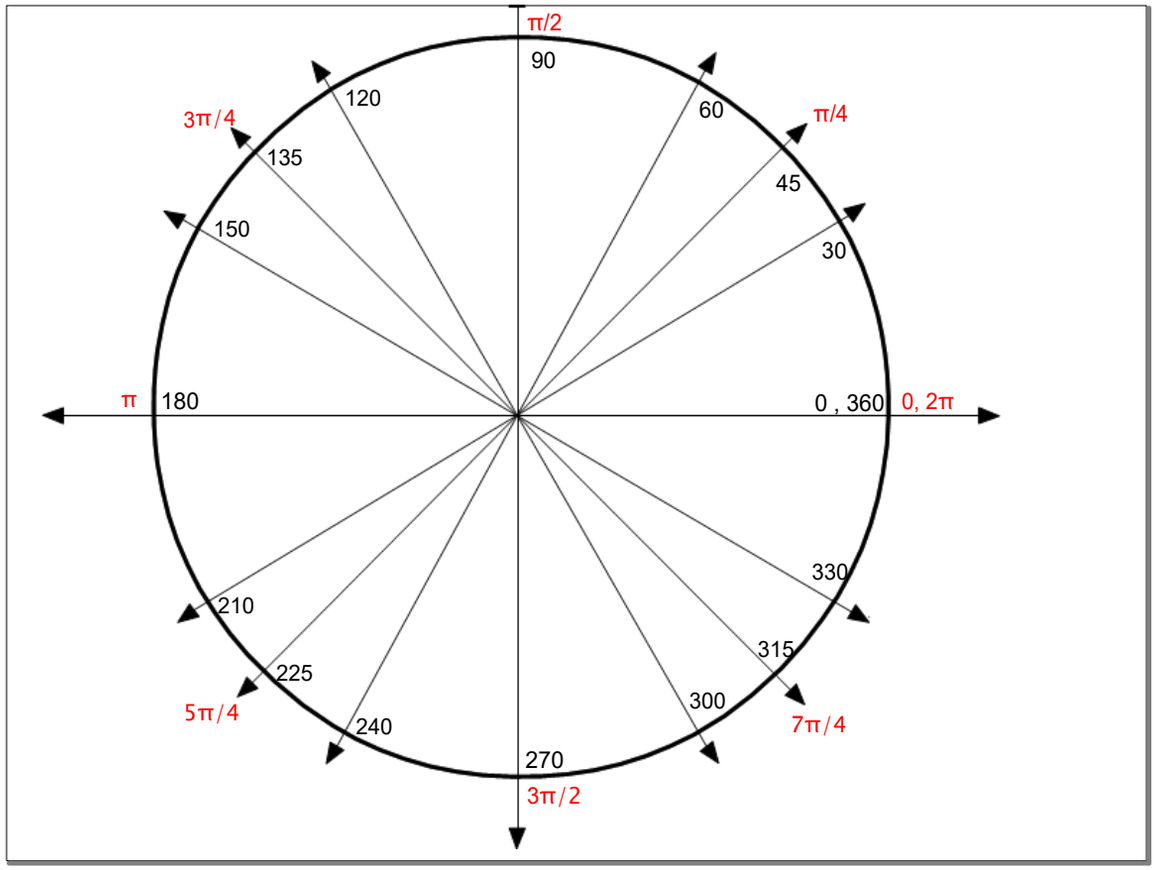

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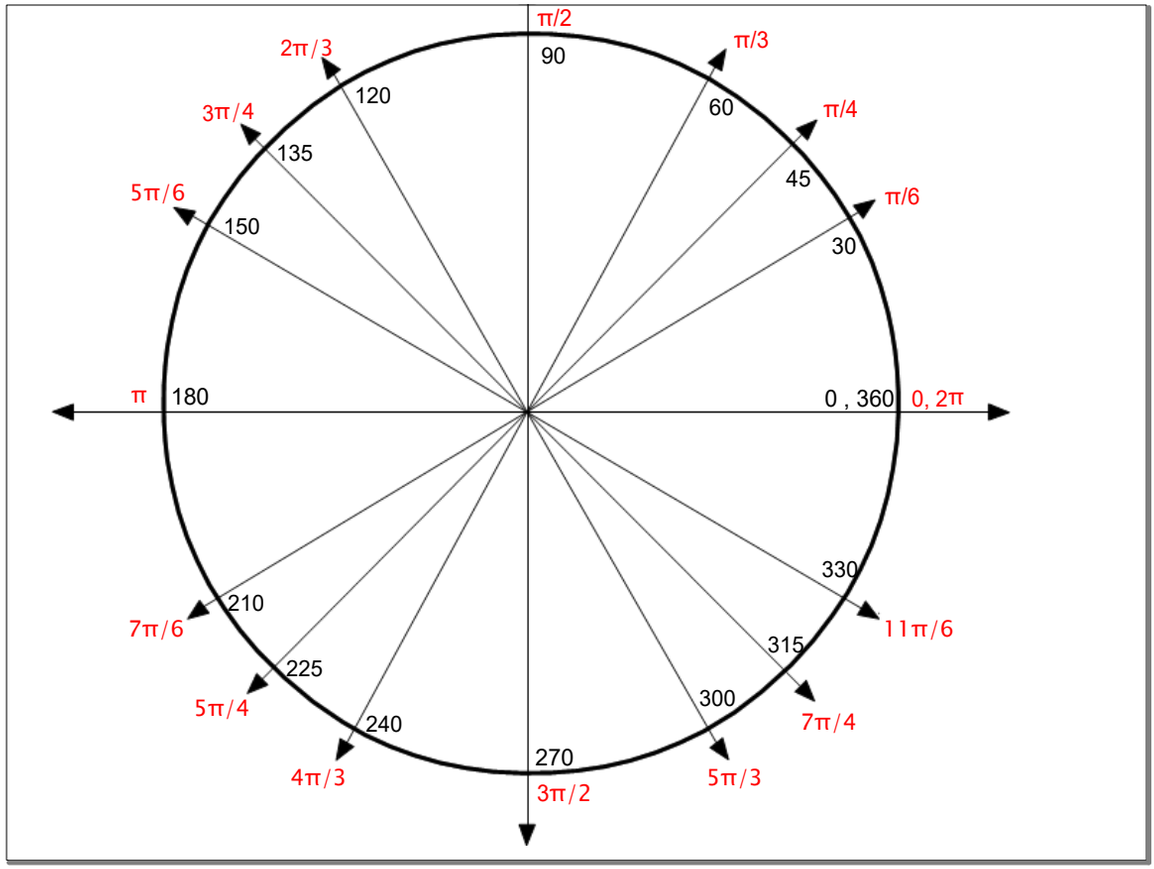

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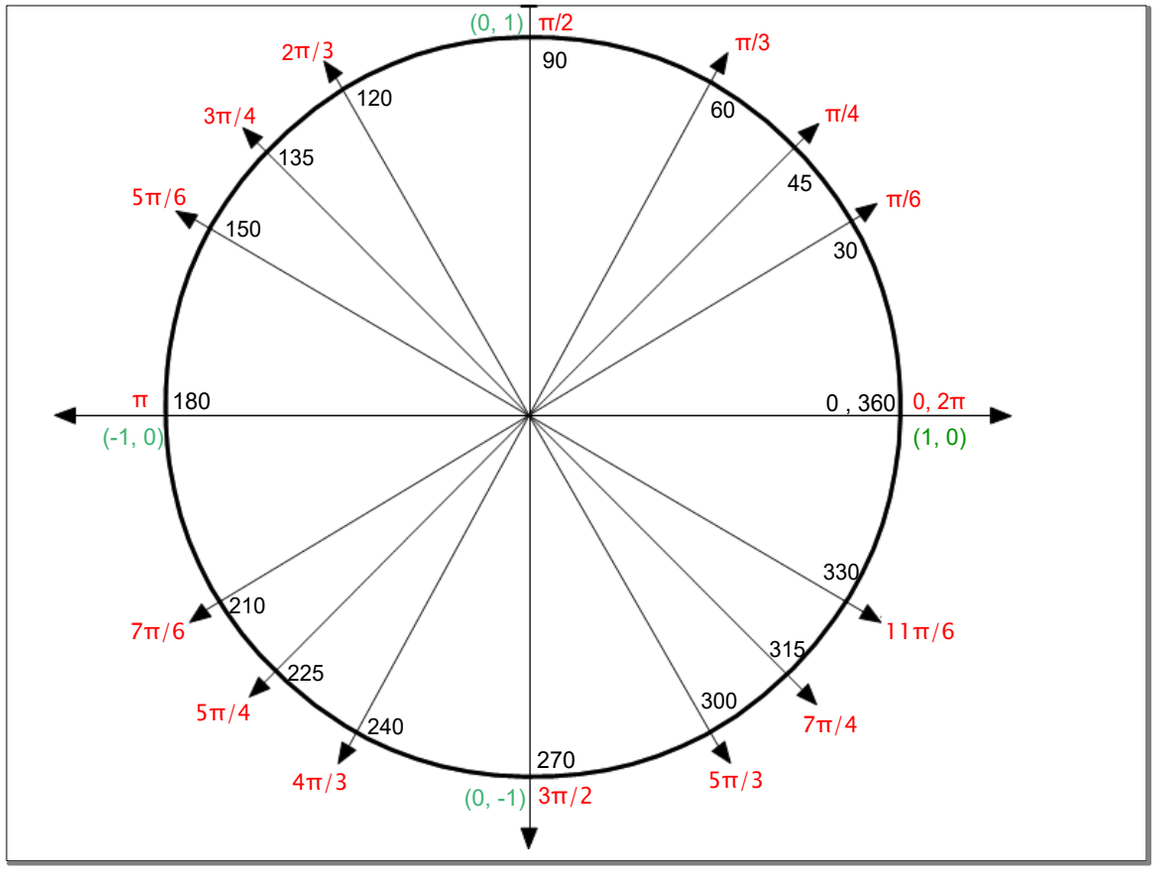

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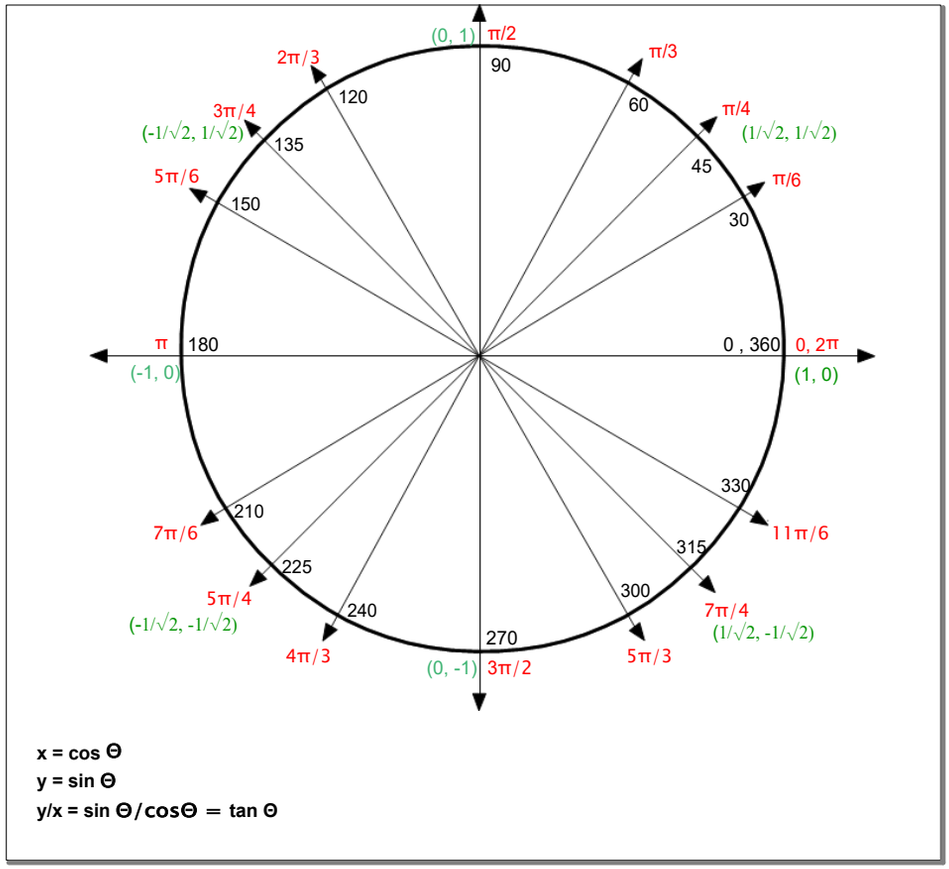

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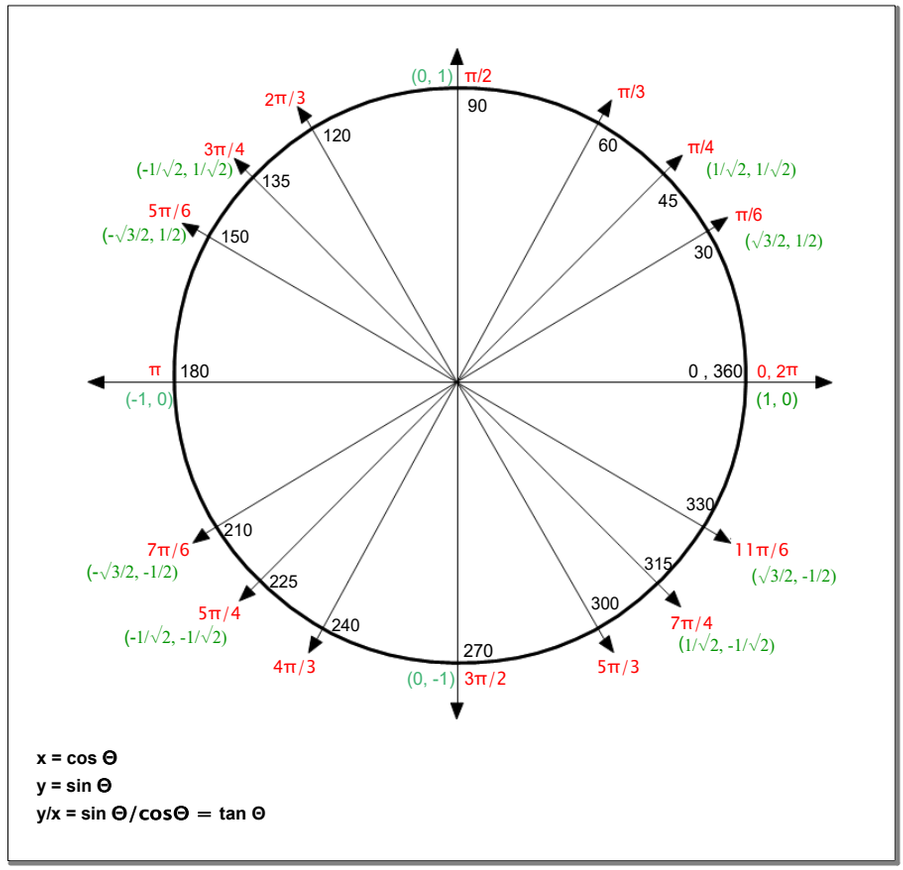

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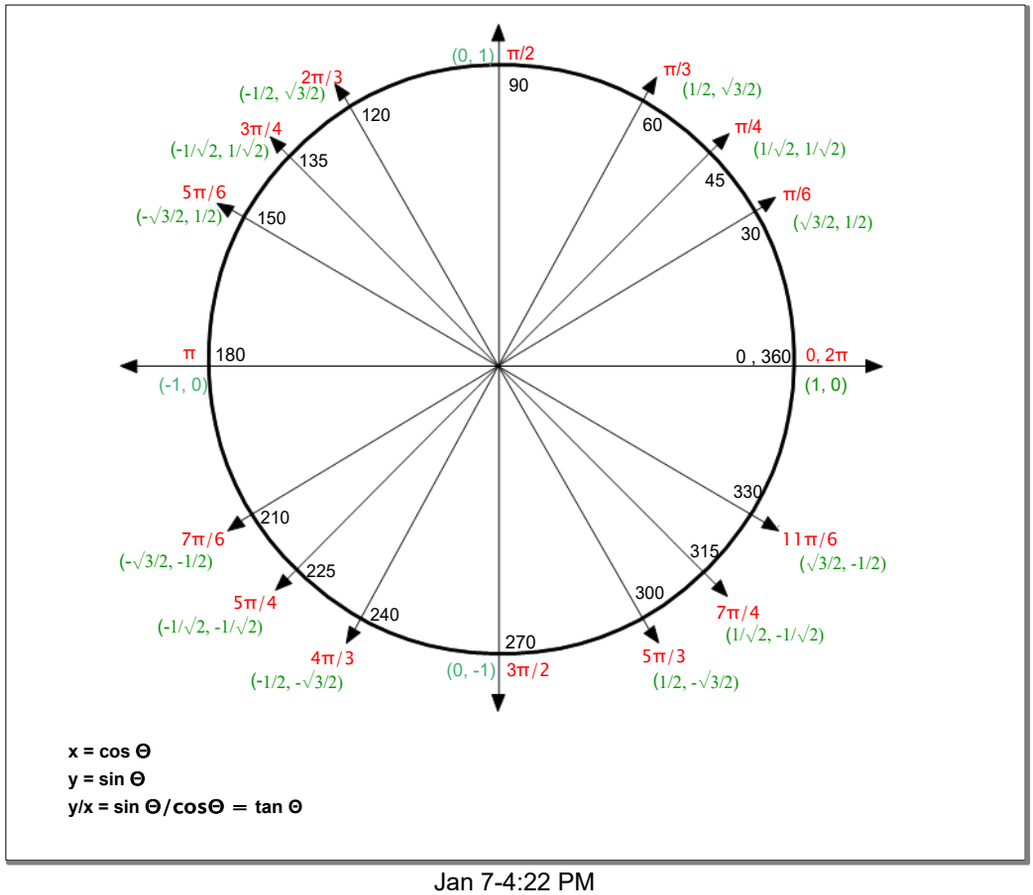

Jan 7-4:22 PM