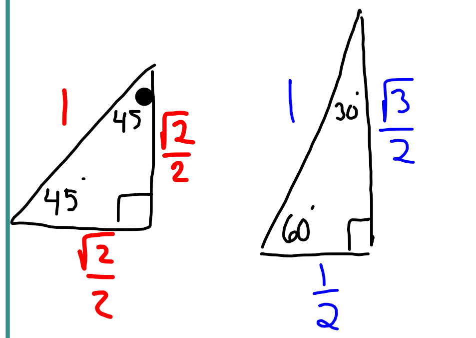
HW Help

Warm Up #1

In your notes, write down the following and put a box around it:

memorize

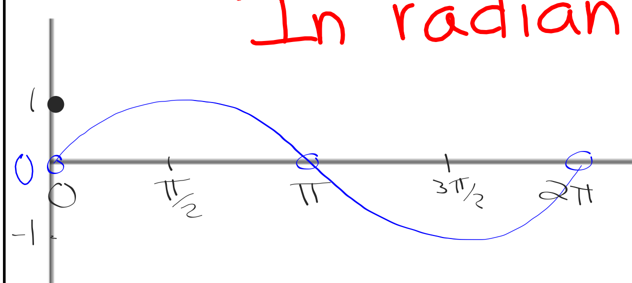


Warm Up #2

Pick up the Six Question Warm Up.

1) Sketch and label one cycle of a sine function. Label the θ *axis* with radians, not degrees. Label the y-axis (also known as the ***sin*** **(*θ*)** axis). Lastly, list the θ axis intercepts.

In radians

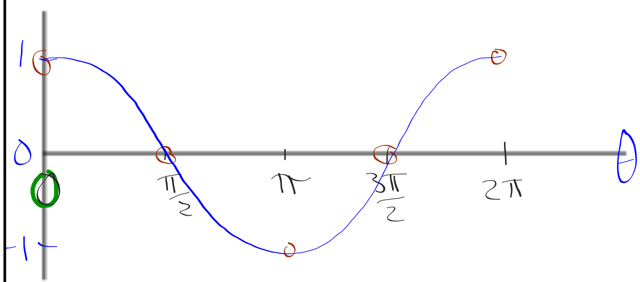


θ axis intercepts 0, π, 2π

general θ =

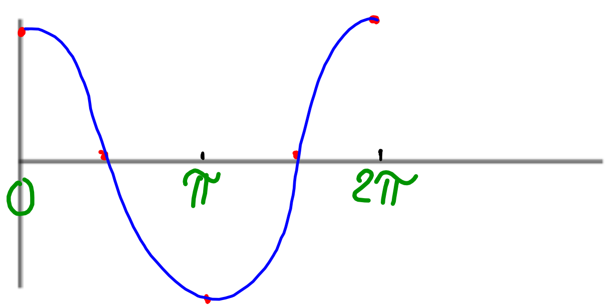
2) Sketch and label one cycle of a cosine function. Label the θ *axis* with radians. Label the y-axis (also known as the $\boldsymbol{cos}$ ($\boldsymbol{\theta}$) axis in this case). Lastly, list the θ axis intercepts.

3)



θ *axis intercepts* $\frac{\pi}{2}$ and $\frac{3\pi}{2}$

Sketch and label one cycle of a cosine function. Label the θ *axis* with radians. Label the y-axis (also known as the $\boldsymbol{cos}$ ($\boldsymbol{\theta}$) axis in this case). Lastly, list the θ axis intercepts.



θ *axis intercepts* $\frac{\pi}{2}$

$\frac{3\pi}{2}$

3.

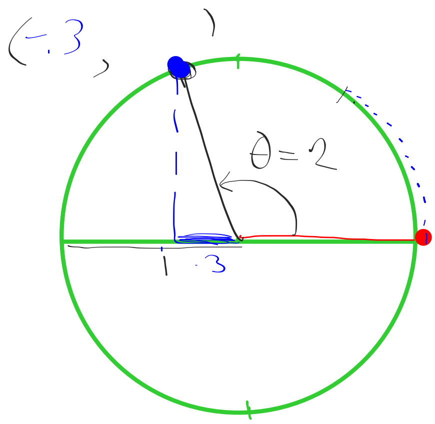
$\cos 2 = -.416$

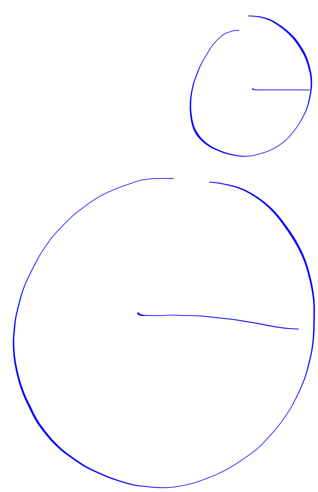
radian mode

$\cos 2^\circ = .999$

degree mode

4) Sketch 2 radians on a unit circle (not 2π radians). Just by using your sketch, estimate the $\cos 2$ and see if it agrees with your answer to #3 above.



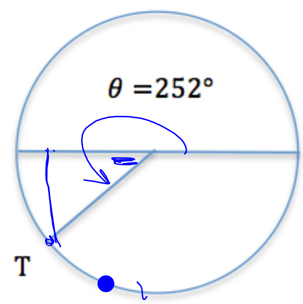


$\cos 2 = -.416$

5) Quickly find the approximate coordinates of point T accurate to three decimal places

cos252 sin252

(-.309, -.951)



Add #6

Assume that you know angle θ in in quadrant III and you know that $\cos\theta = -\frac{4}{5}$

Without using a calculator, find $\sin\theta$. *[hint: Use the Pythagorean Identity]*

$\sqrt{\frac{9}{25}}$

$\left[\frac{-4}{5}\right]^2 + \sin^2(\theta) = 1$

$\frac{16}{25} + \sin^2(\theta) = \frac{25}{25}$

$\sin^2(\theta) = \frac{9}{25}$

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

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

HW QUESTIONS

$\boxed{82a}$ $\frac{y}{3} = \frac{3x^2}{3} - \frac{18x}{3} + \frac{26}{3}$

$y = a(x-h)^2 + K$

$\frac{y}{3} - \frac{26}{3} + 9 = x^2 - 6x + 9$

$y = 3(x-3)^2 - 1$

$\frac{y}{3} - \frac{26}{3} + 9 = (x-3)^2$

multiply by 3

$y - 26 + 27 = 3(x-3)^2$

$y + 1$

Vertex

$(3, -1)$

$x = 3$ axis of symm

$\boxed{77}$

a) $\sin 60^\circ$, $\sin\left(\frac{\pi}{3}\right)$ } same!

b) $\sin\left(\frac{\pi}{4}\right) =$

$\sin\left(?\right) =$

$\boxed{78}$ a) $\sin\left(\frac{\pi}{4}\right) \approx$

b) $\sin\left(\frac{2\pi}{3}\right) \approx$

$\boxed{79}$ (a) $x(2x-1)(x-3)=0$

$x=0$ $\quad 2x-1=0 \quad x-3=0$

$2x=1 \quad x=3$

$x=0 \quad x=\frac{1}{2}$

Solutions: $x=0$

$x=\frac{1}{2}$

$x=3$

(b) $2x^3+x^2-3x=0$

80 a $\quad 5^x = 72$

short way

longer (but valid) method.

80c $\quad 3^{2x+4} = 17$

<u>shorter</u>

$2x+4 = \log_3(17)$

$2x+4 = \frac{\log(17)}{\log(3)}$

$2x = \frac{\log 17}{\log 3} - 4$

$x = \frac{1}{2}\left(\frac{\log 17}{\log 3}\right) - \frac{1}{2}(4)$

83 a

$171 = 3(5^x)$

b

$171y = 3(x^5)$

divide by 3

$\frac{171y}{3} = x^5$

$57y = x^5$

take 5^{th} root

$\boxed{85}$ $y = 2\sqrt{\frac{x-3}{4}} + 1$ domain $x \geq 3$ range $y \geq 1$

$x = 2\sqrt{\frac{y-3}{4}} + 1$ domain $x \geq 1$ range

$x - 1 = 2\sqrt{\frac{y-3}{4}}$

$\frac{x-1}{2} = \sqrt{\frac{y-3}{4}}$

$\frac{x-1}{2} = \sqrt{\frac{y-3}{4}}$ domain: $x \geq 1$

$\left(\frac{x-1}{2}\right)^2 = \frac{y-3}{4}$

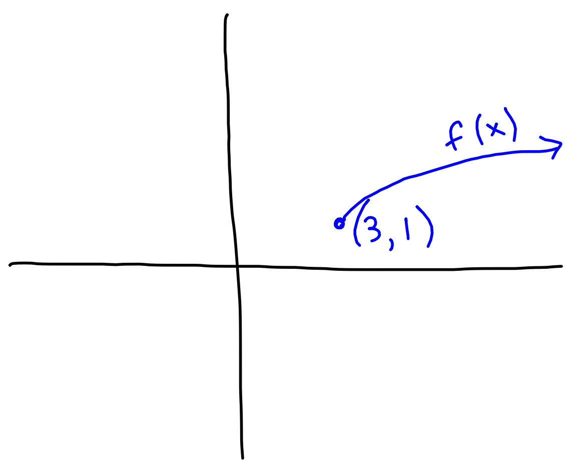
$\frac{(x-1)^2}{2^2} = \frac{y-3}{4}$

$$\frac{(x-1)^2}{2^2} = \frac{y-3}{4}$$

$$\cancel{4}\,\frac{(x-1)^2}{\cancel{4}} = y-3$$

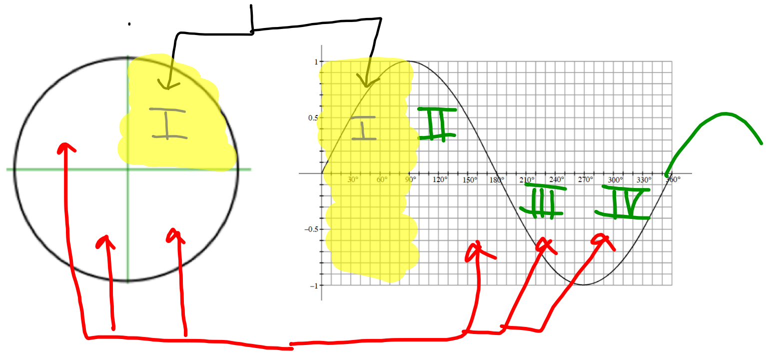
$f'(x) =$

limited to



Last class

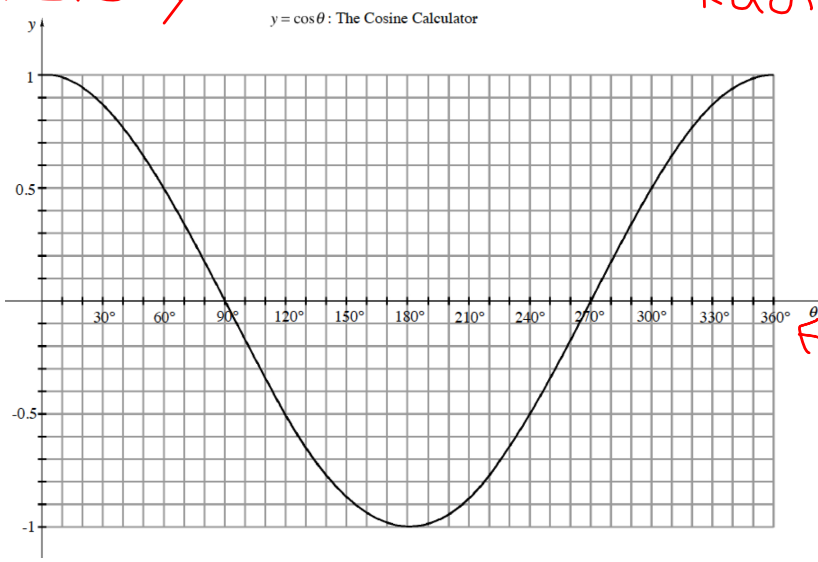
Information here



Tells us a lot about

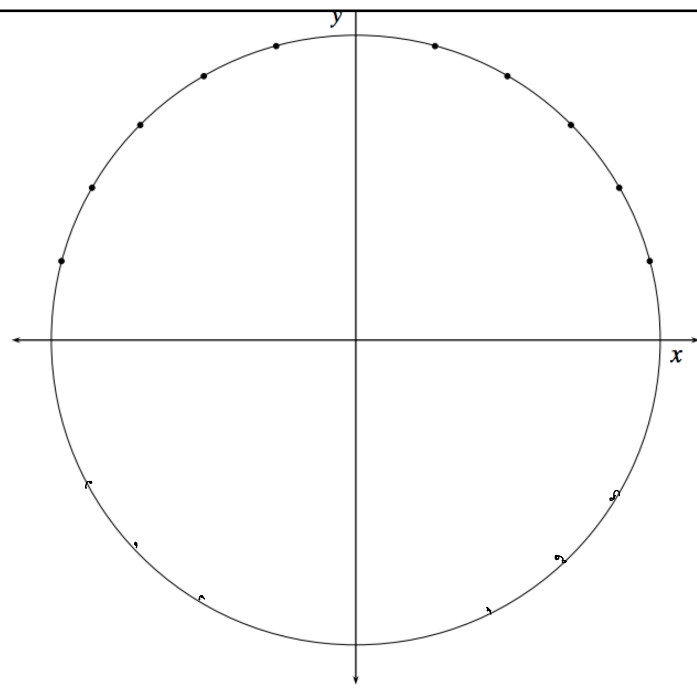
Yesterday

Radians



Inside

-Radians

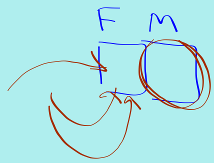


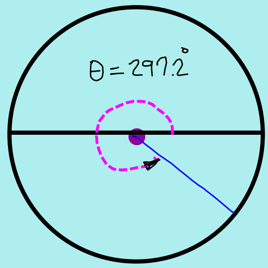
AIM

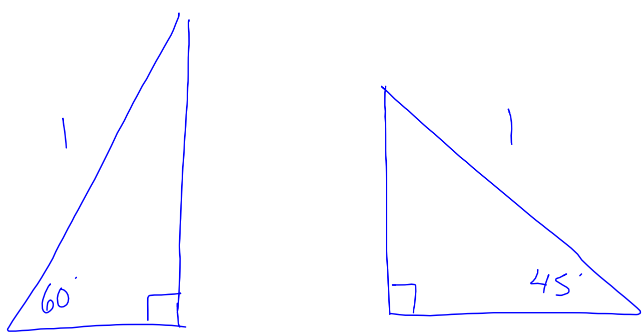
$\cos(30^\circ) =$

Find the exact values of sine and cosine from a unit circle.

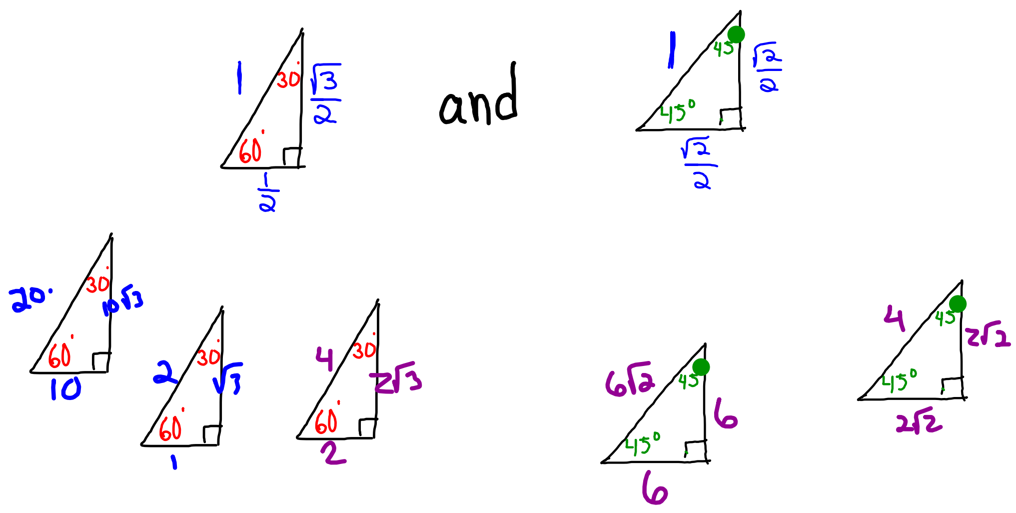
$\cos(3.5) =$

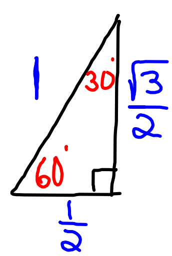






Memorize



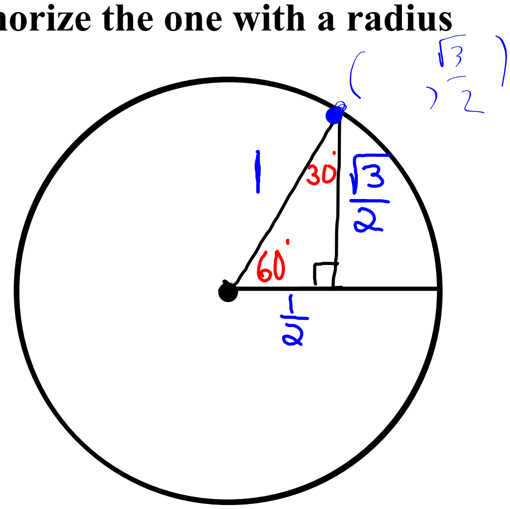


There are an infinite number of 30-60-90 triangles. There is a reason I am I having you memorize the one with a radius of 1.

$\cos(60^\circ) =$

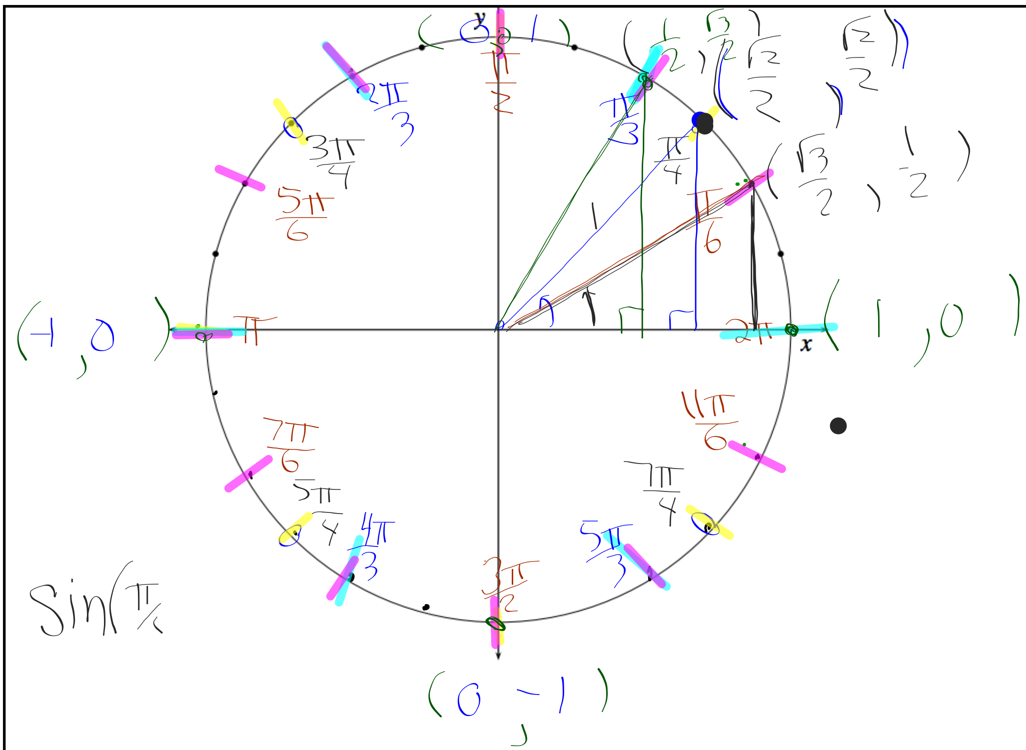
$\sin(60^\circ) = \frac{\sqrt{3}}{2}$

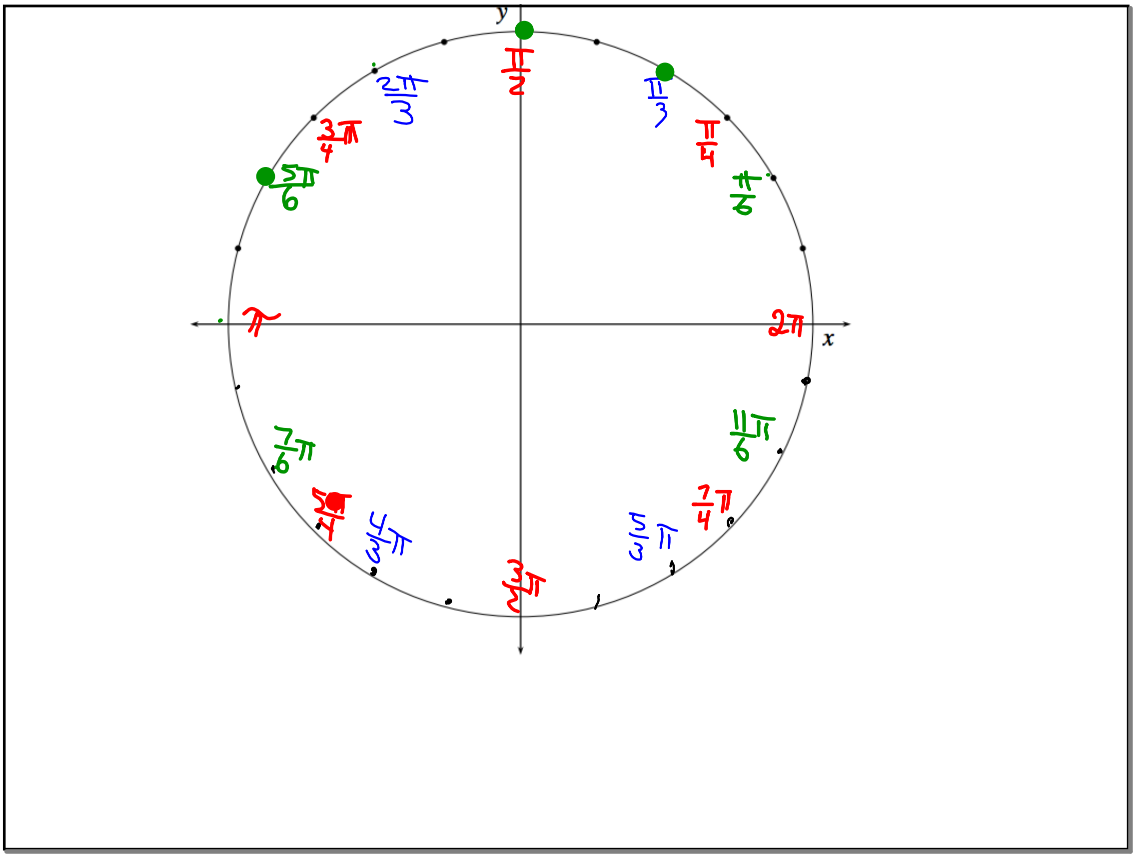
~~$\sin(30^\circ)$~~

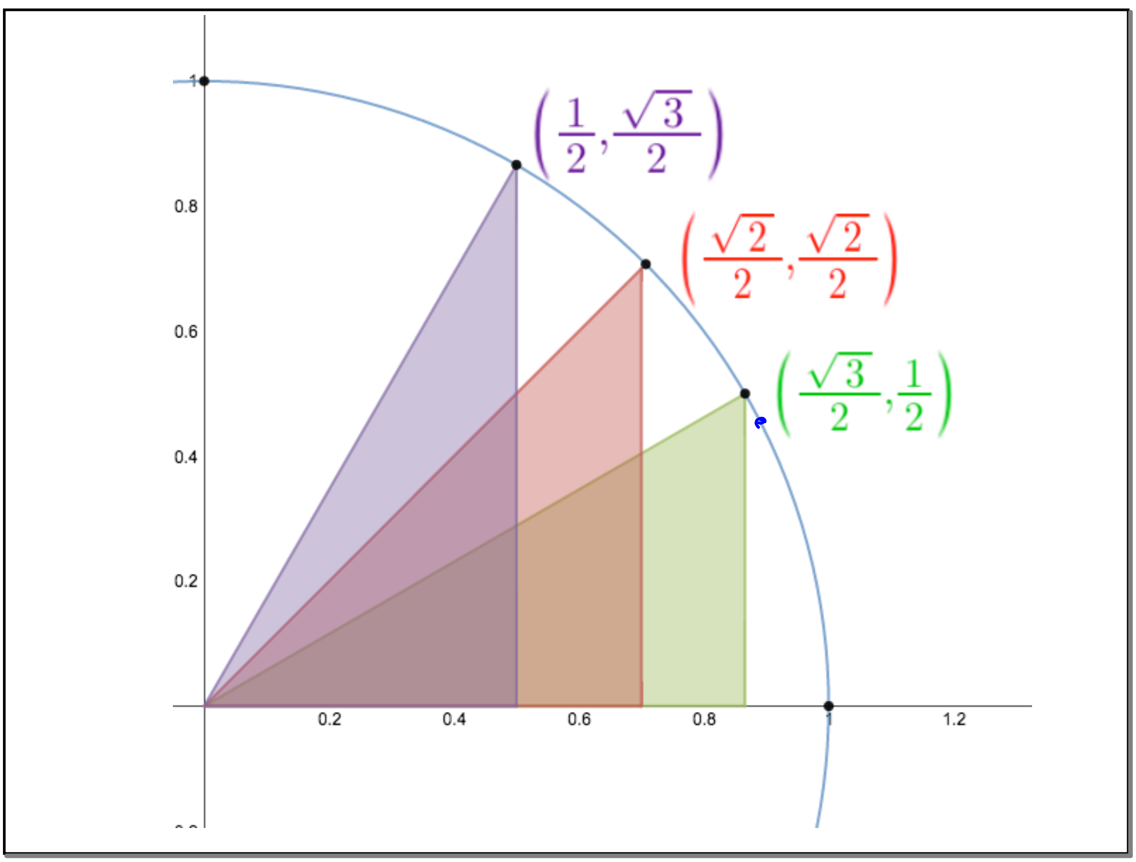


TASK

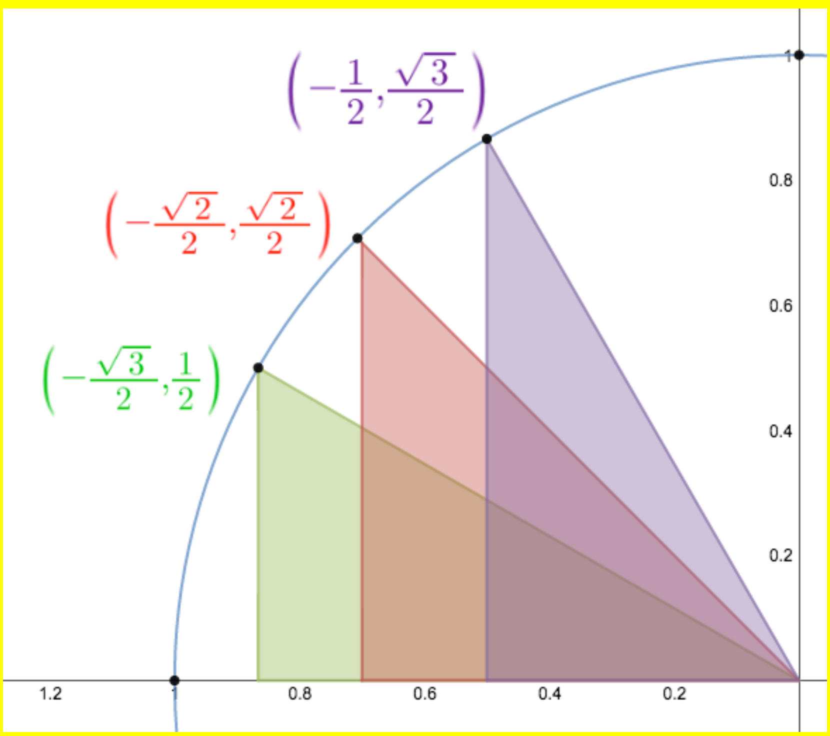
Find all of the other Quadrant 1 exact coordinates, if possible




y
x
$\frac{\pi}{2}$
$\frac{\pi}{3}$
$\frac{\pi}{4}$
$\frac{\pi}{6}$
$\frac{2\pi}{3}$
$\frac{3\pi}{4}$
$\frac{5\pi}{6}$
π
2π
$\frac{7\pi}{6}$
$\frac{5\pi}{4}$
$\frac{4\pi}{3}$
$\frac{3\pi}{2}$
$\frac{5\pi}{3}$
$\frac{7\pi}{4}$
$\frac{11\pi}{6}$

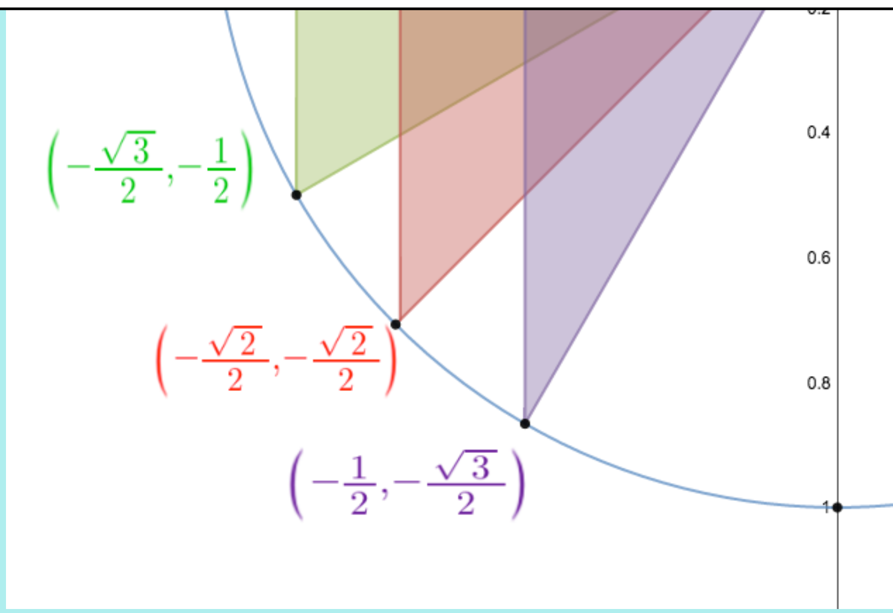

$\left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$
$\left(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right)$
$\left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$
1
0.8
0.6
0.4
0.2
0.2
0.4
0.6
0.8
1
1.2

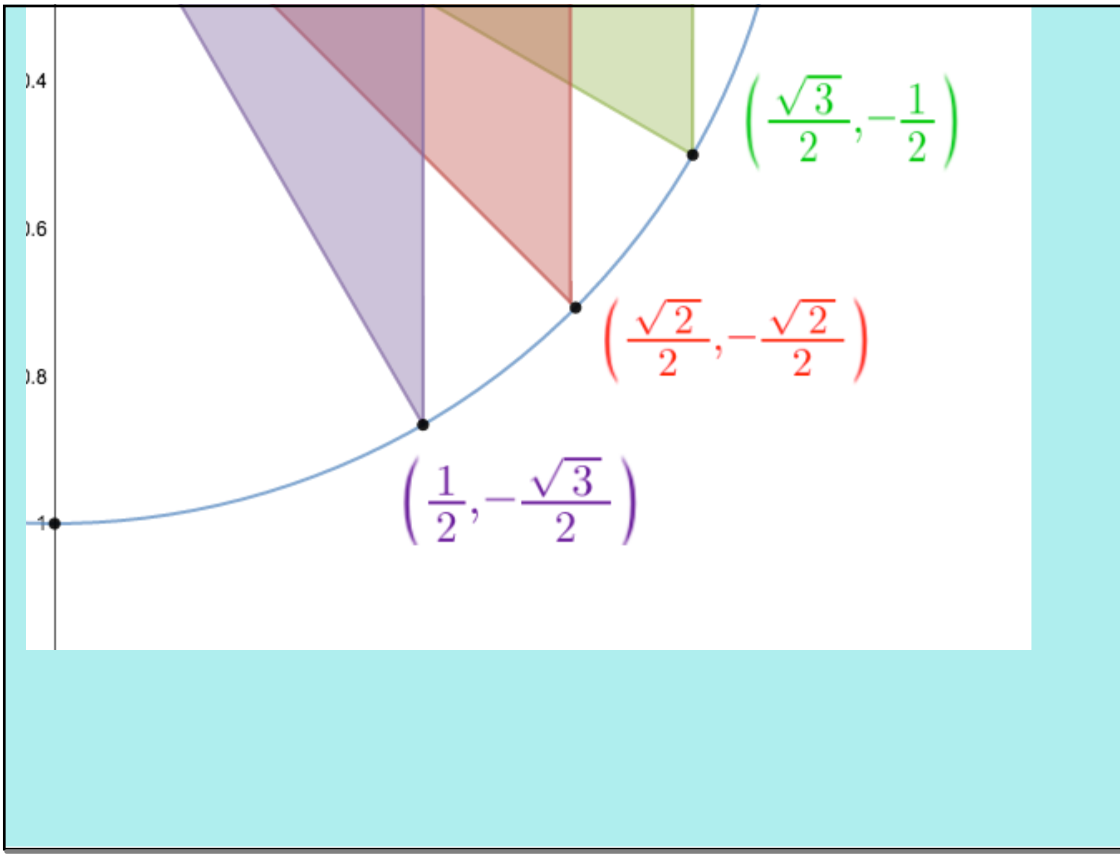
Find all exact coordinates possible in Quadrant 2



Find all exact coordinates possible in

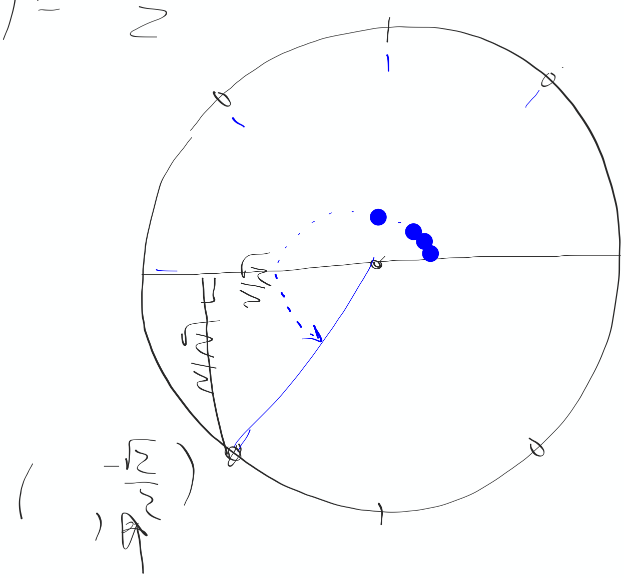
Quadrants 3 and 4

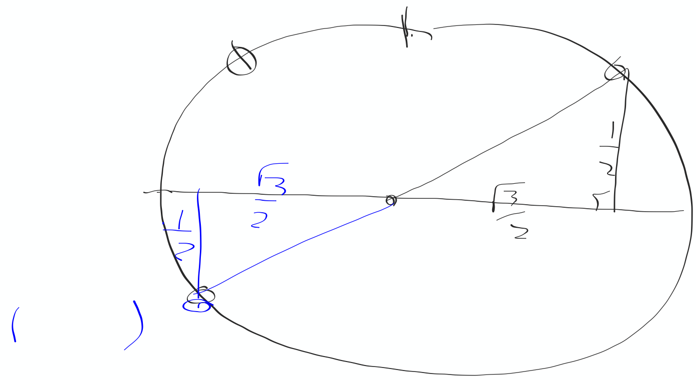




$\sin\left(\frac{5\pi}{4}\right) = -\frac{\sqrt{2}}{2}$

$\frac{\pi}{4}$





B.B.

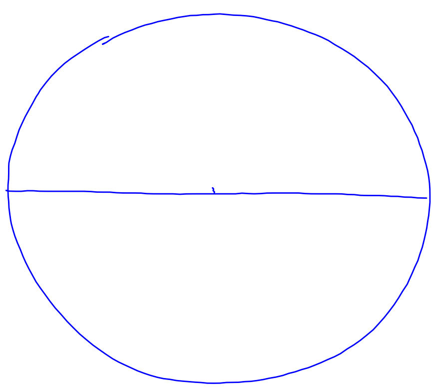
NOTES

$\boxed{7-88}$

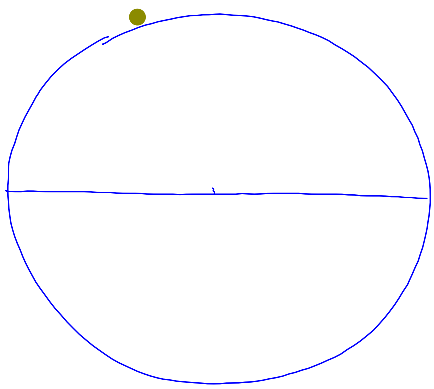
together

7-88. Draw a new unit circle, label a point that corresponds to a rotation of $\frac{\pi}{12}$, and put your calculator in radian mode.

a. What are the coordinates of this point, correct to two decimal places?



a. What are the coordinates of this point, correct to two decimal places?



$\cos\left(\frac{\pi}{12}\right)$ $\sin\left(\frac{\pi}{12}\right)$

$(.97, .26)$

(i) $\sin\left(-\frac{\pi}{12}\right) \approx$

(ii) $\cos\left(\frac{13\pi}{12}\right) \approx$

(iii) $\cos\left(\frac{7\pi}{12}\right) \approx$

b. Use the information you found in part (a) to determine each of the following values: (Hint: Drawing each angle on the unit circle will be very helpful.)

i. $\sin(-\frac{\pi}{12})$ $\approx$

ii. $\cos\frac{13\pi}{12}$ $\approx$

iii. Challenge: $\cos\frac{7\pi}{12}$

7-89

together

7-89. For angle α in the first quadrant, $\cos\alpha = \frac{8}{17}$. Use that information to find each of the following values without using a calculator. Be prepared to share your strategies with the class.

a. $\sin\alpha$

Use the Pythagorean Identity.

b. $\sin(\pi + \alpha)$

c. $\cos(2\pi - \alpha)$

LCQ

Assignment:

Worksheet "Assignment 7.1.6"

-do both sides
-on the back, try it without looking at your notes.