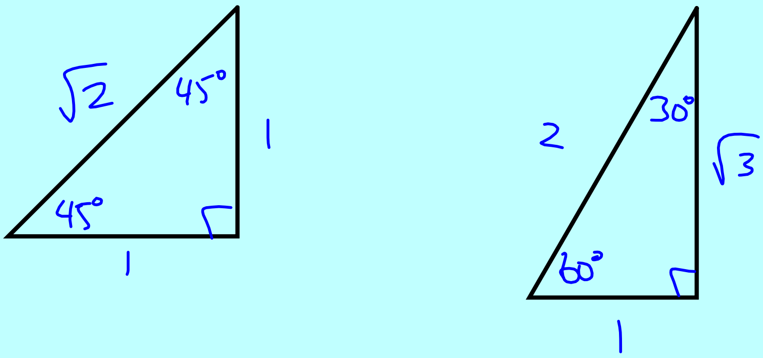
Constructing the Unit Circle

Recall: Special Triangles

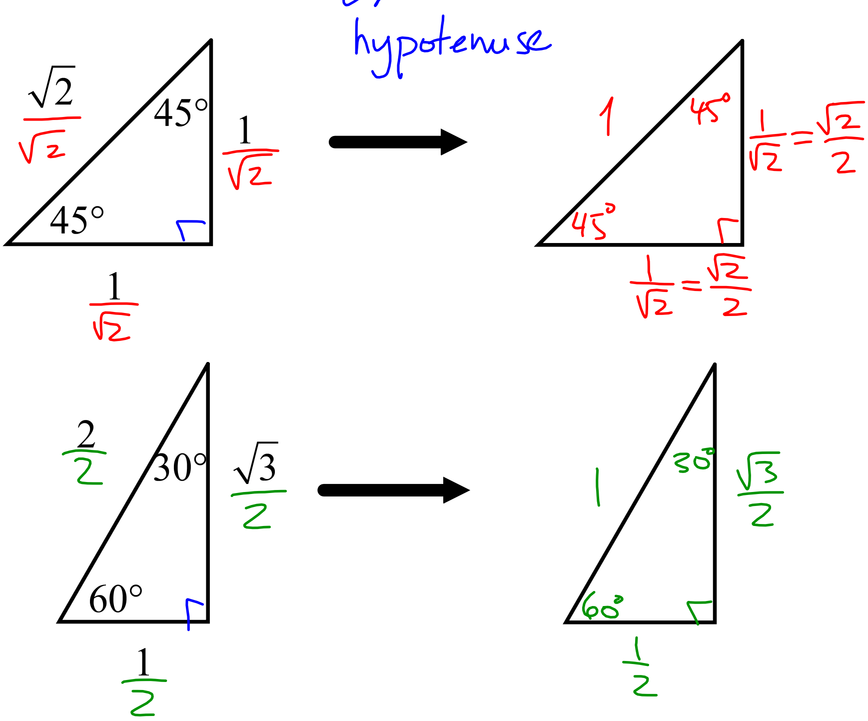


May 4-9:09 AM

Constructing the Unit Circle

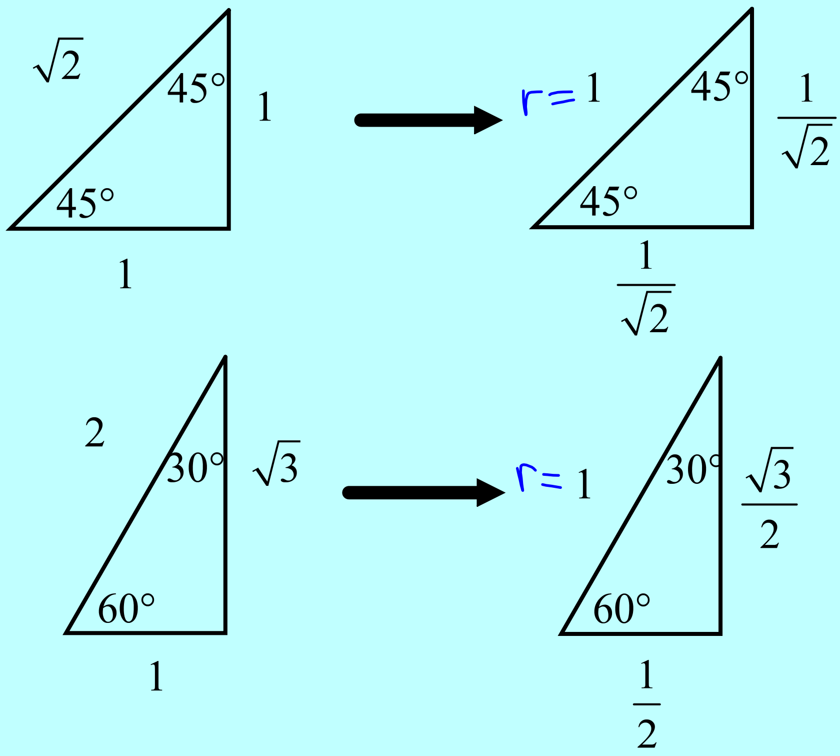
Suppose we wanted to force r = 1 in the special triangles.

hypotenuse



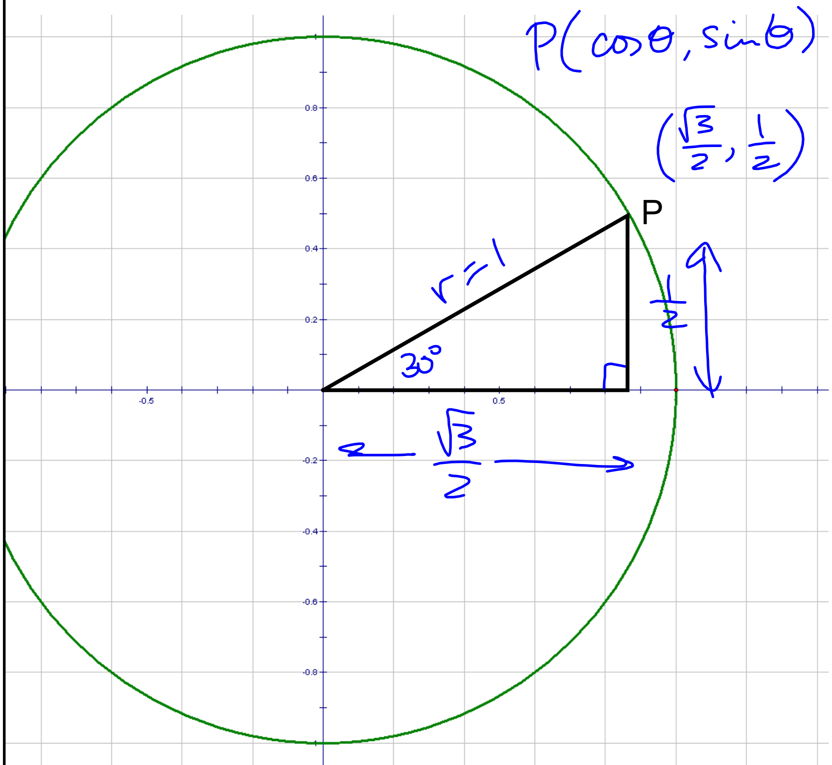
May 11-8:06 PM

Suppose we wanted to force r = 1 in the special triangles.



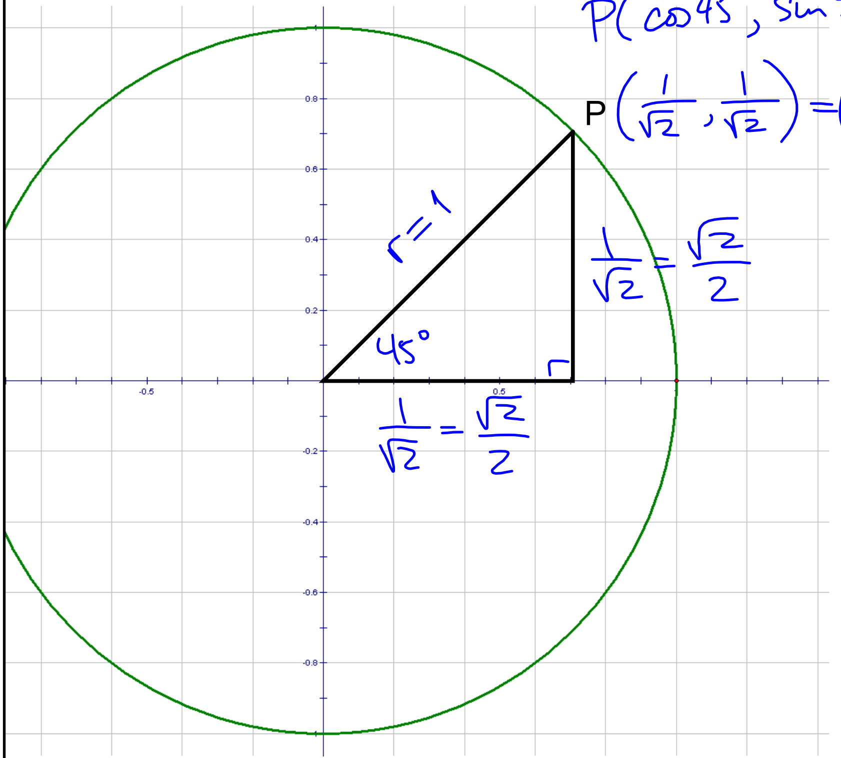
May 11-8:06 PM

Place the special triangles, with r = 1, on the unit circle, and determine the coordinates of the point P.



May 4-10:17 AM

Place the special triangles, with r = 1, on the unit circle, and determine the coordinate of the point P.

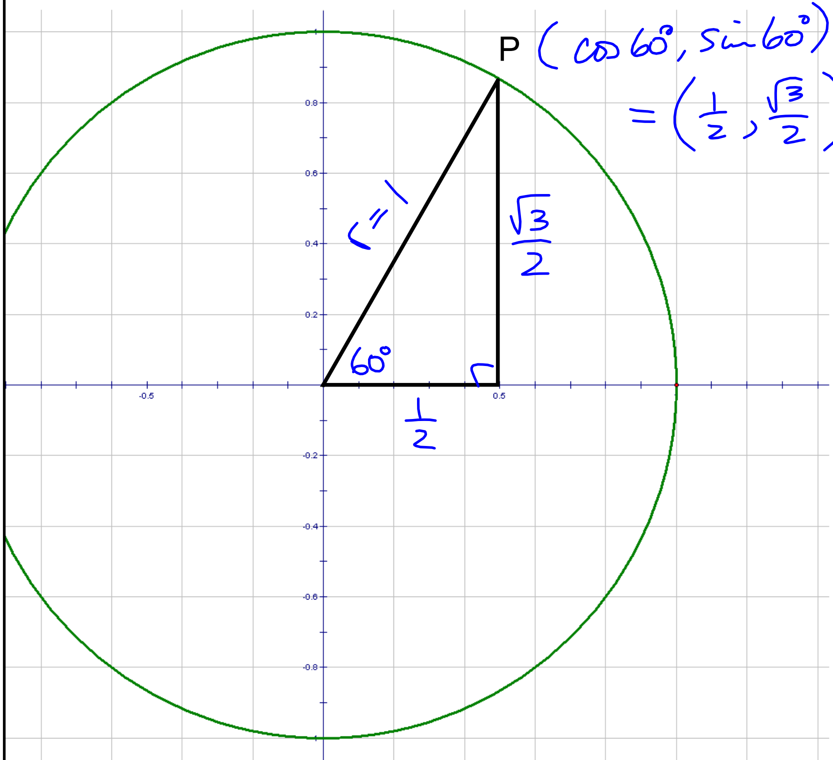


$P(\cos 45°, \sin 45°)$

$P\left(\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right) = \left(\frac{\sqrt{2}}{2}, \frac{\sqrt{2}}{2}\right)$

May 4-10:17 AM

Place the special triangles, with r = 1, on the unit circle, and determine the coordinate of the point P.



$P(\cos 60°, \sin 60°)$

$= \left(\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$

May 4-10:17 AM

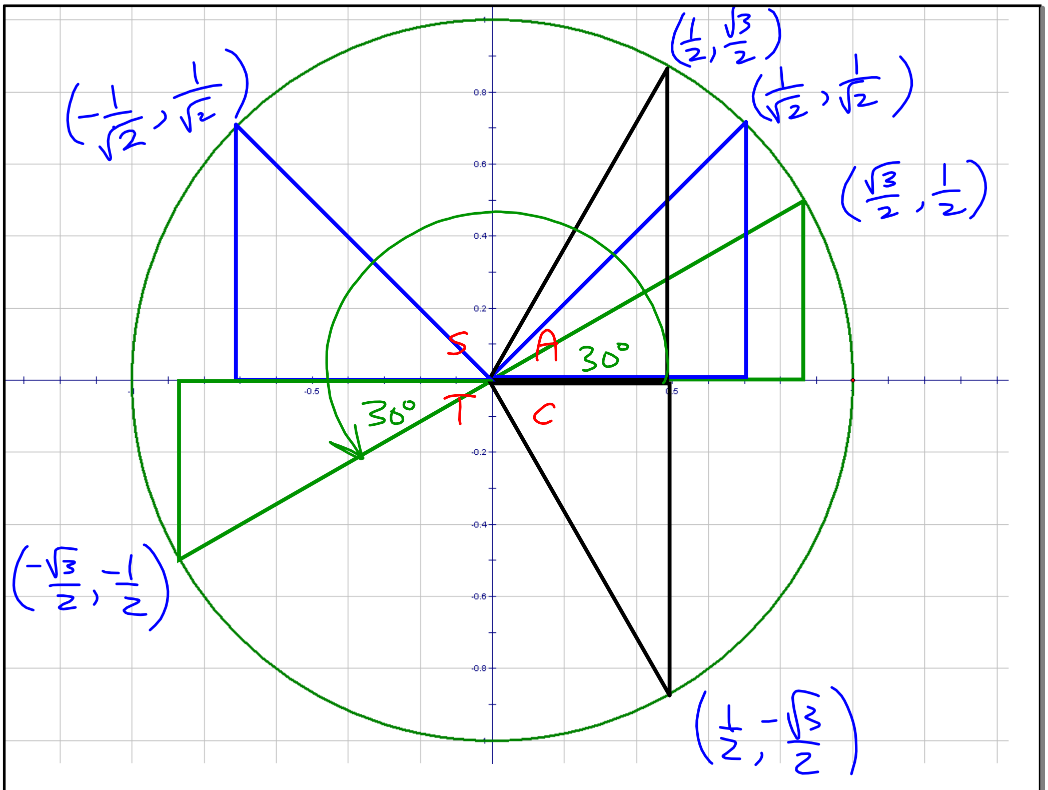
The coordinates of any point on a circle can be expressed as:

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

For the unit circle, r = 1, so any point is:

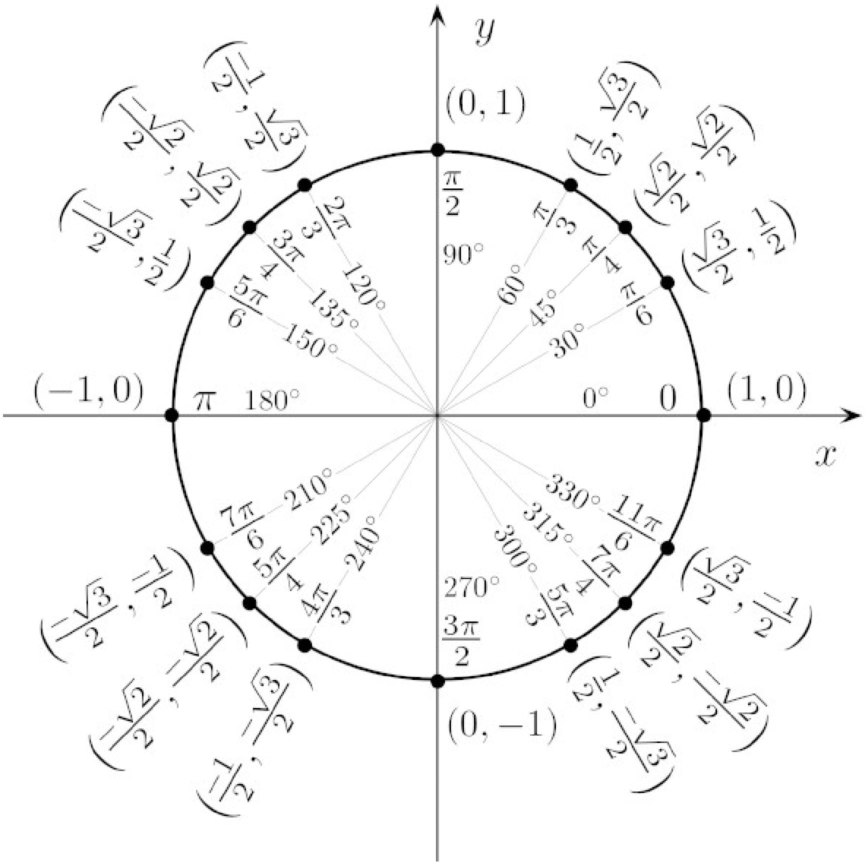
$$P(\cos\theta, \sin\theta)$$

Dec 5-9:18 AM



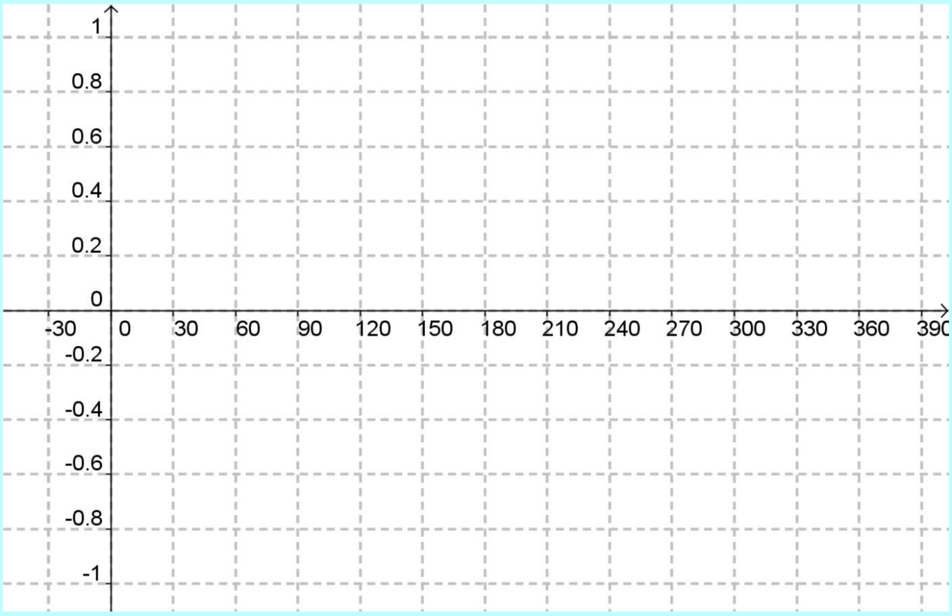
$$\cos 210° = -\cos 30°$$

May 4-10:17 AM



May 11-8:28 PM

Use the values from the unit circle to graph sine and cosine.



Dec 5-9:01 AM

Assigned Work:

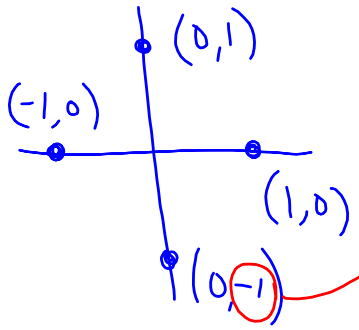
handout # 2, 3, 4, 7, 9, 11, 12, 13

e a a a

9(a) $f(x) = \sin x$ $\quad f(x) = -1$

$\sin x = -1$

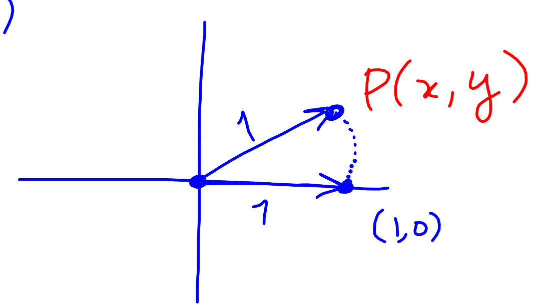
$P(\cos\theta, \sin\theta)$



$x = 270°$

Dec 5-9:23 AM

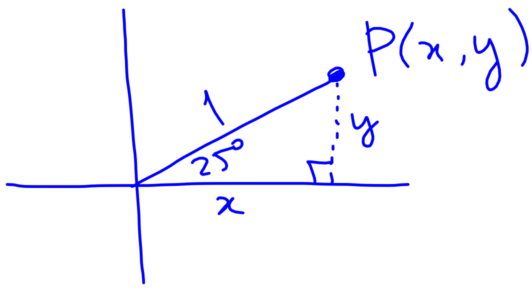
11(a)



① $P(\cos\theta, \sin\theta)$

$= P(\cos 25°, \sin 25°)$

$\doteq$ ______



$\cos 25° = \frac{x}{1}$

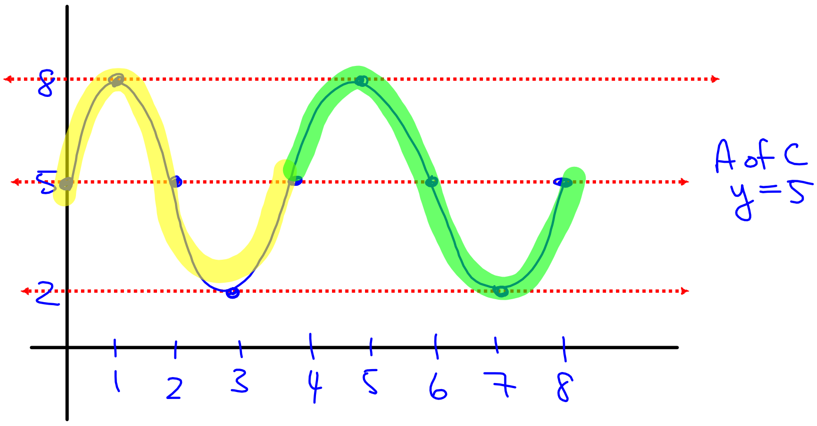
$x = \cos 25°$

$y = \sin 25°$

May 21-12:37 PM

12(a) $T=4$ $a=3$ A of C: $y=5$

for 2 cycles



Sinusoidal

sine OR cosine

May 21-12:41 PM

13(a) $h(10)$ where $h(t) = 5\cos(18^\circ t)$

① ② ③ ④

① the height of Jim at $t = 10$ seconds

② amplitude $= 5$ → radius of Ferris wheel.

③ cosine graph → starts at max.

④ $k = 18^\circ$ ⟹ h. compression

$$\text{period} = \frac{360^\circ}{18^\circ}$$

$= 20$ seconds

May 21-12:45 PM