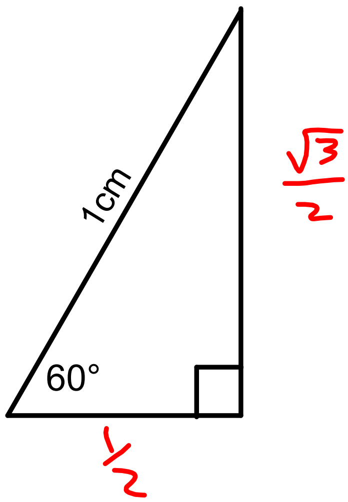
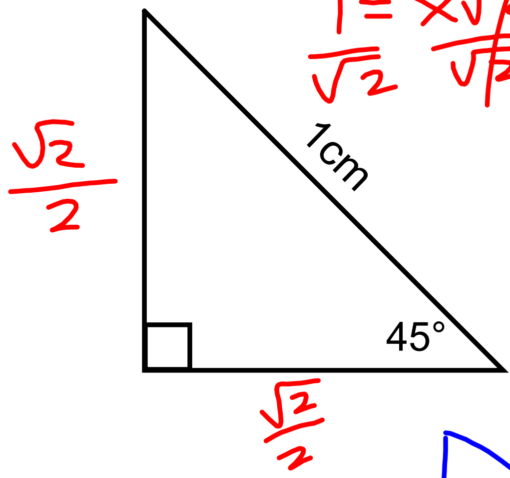
Bellwork: Find the missing sides of the special right triangles below



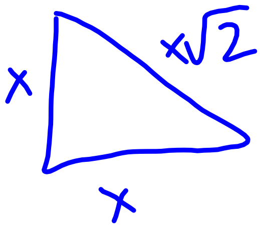


$1 = x\sqrt{2}$

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

$\frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$

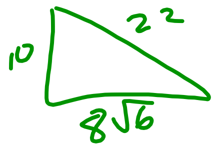
$\sqrt{4} = 2$



Homework 7.1 Solutions

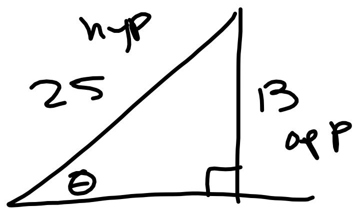
1. sin A= 3/5 sin B= 4/5
   cos A= 4/5 cos B= 3/5
   tan A= 3/4 tan B= 4/3

2. sin A= 5/11 sin B= 4 $\sqrt{6}$/11
   cos A= 4$\sqrt{6}$/11 cos B= 5/11
   tan A= 10/8$\sqrt{6}$ = 5/ 4$\sqrt{6}$ tan B= 4$\sqrt{6}$/5



3. B= 58.67° A = 31.33°
4. A= 48.19°
5. 14.79 cm²
6. 18.43 cm²
7. 10.24 in²
8. 89.12 ft²

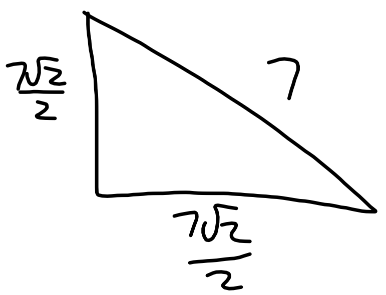
★ x= 23, tan A= 21/20



$\sin^{-1}\left(\frac{13}{25}\right) = 31.33°$

Homework 7.2 Solutions

1. a) $\frac{23\pi}{15}$ b) $\frac{\pi}{4}$ c) $\frac{\pi}{3}$ d) $\frac{2\pi}{5}$
2. a 180° b) 35° c) 315° d) 270°
3. u=7$\sqrt{2}$ v=7
4. n=3$\sqrt{2}$ m=3$\sqrt{2}$
5. a=6$\sqrt{2}$ b=6
6. x=10$\sqrt{2}$ y= 10
7. a=7 b=7$\sqrt{2}$/2
8. x=12 y=6
9. u=8 v=4$\sqrt{3}$
10. x= 4$\sqrt{3}$/3 y=2$\sqrt{3}$/3
11. x=7 y=7$\sqrt{3}$/2
12. u=2 v=2$\sqrt{3}$/3



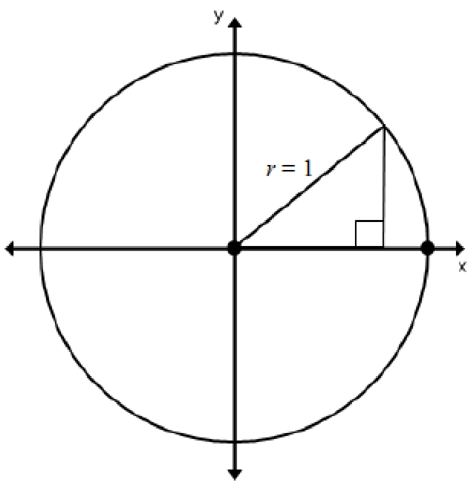
$\frac{7\sqrt{2}}{2} \cdot \frac{\sqrt{2}}{1} = \frac{7\cancel{2}}{\cancel{2}}$

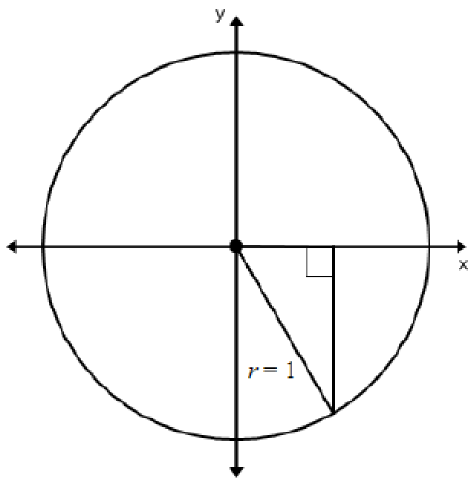
Lesson 7.3 Objectives:

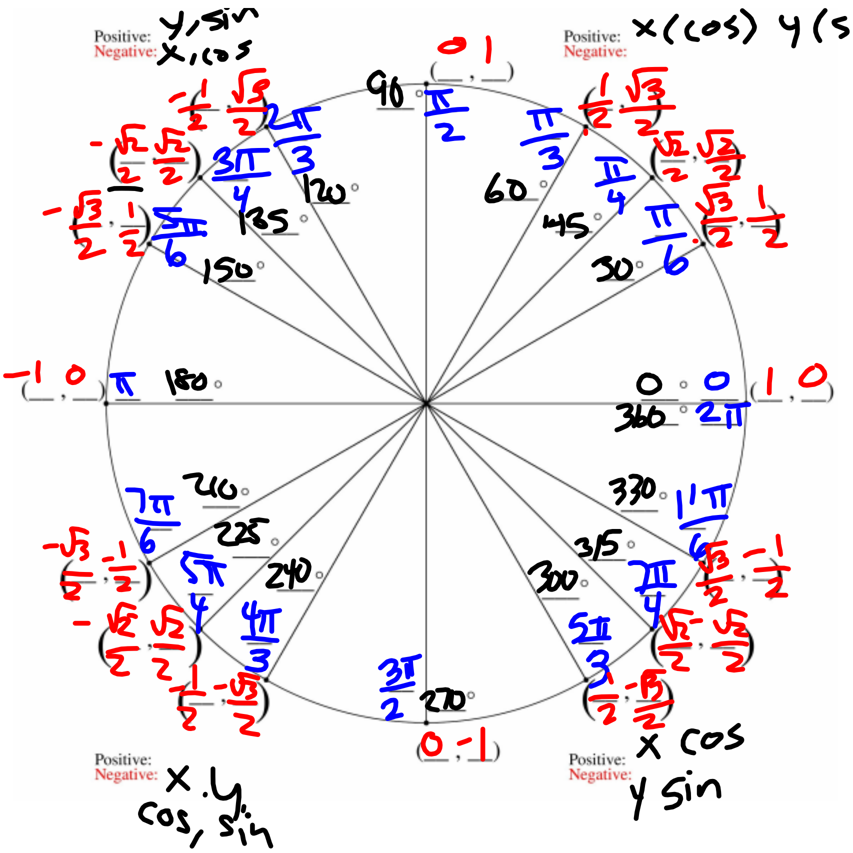
I can create the unit circle using trigonometric ratios of special right triangles

A **Unit Circle** is a circle with a radius of 1.

Any right triangle with a hypotenuse of length 1 can be drawn in any quadrant of the circle.



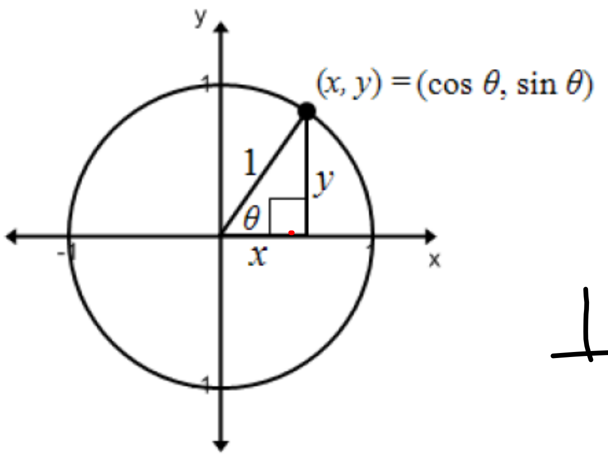




1) $\cos(135^\circ)$

$-\frac{\sqrt{2}}{2}$

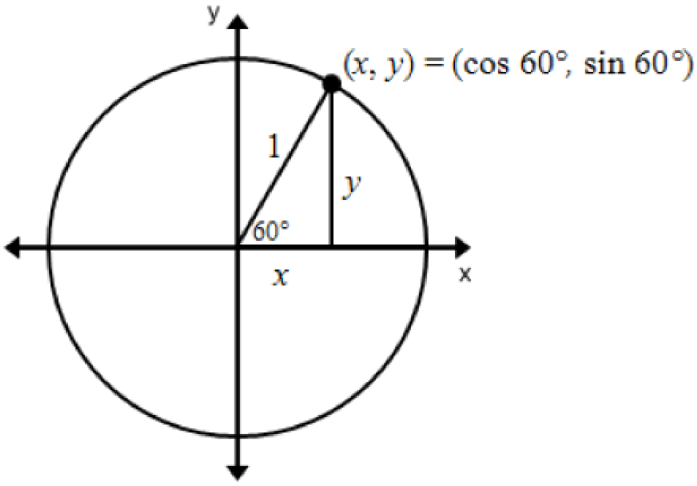
We can place the unit circle on a coordinate plane and use right triangle trigonometry to find basic trig ratios.

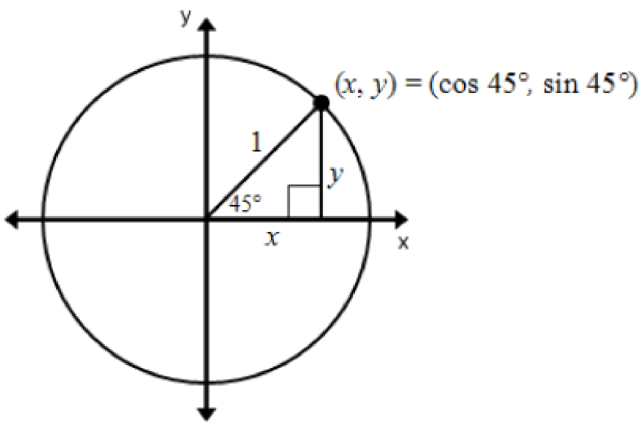


$\sin\theta = \frac{\text{opposite}}{\text{hypotenuse}}$ $\cos\theta = \frac{\text{adjacent}}{\text{hypotenuse}}$

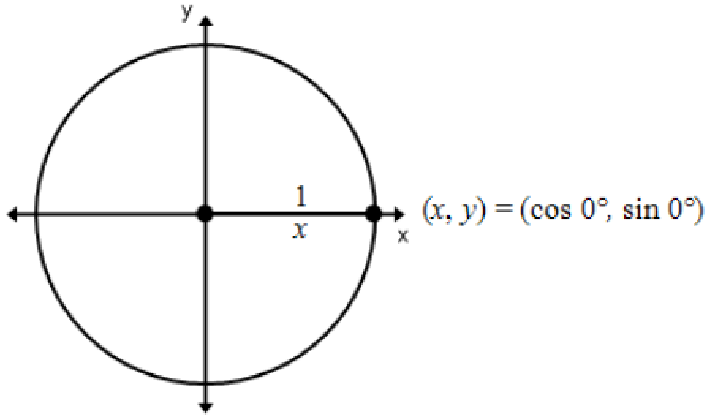
$\sin\theta = \frac{y}{1}$ $\cos\theta = \frac{x}{1}$

$\sin\theta = y$ $\cos\theta = x$

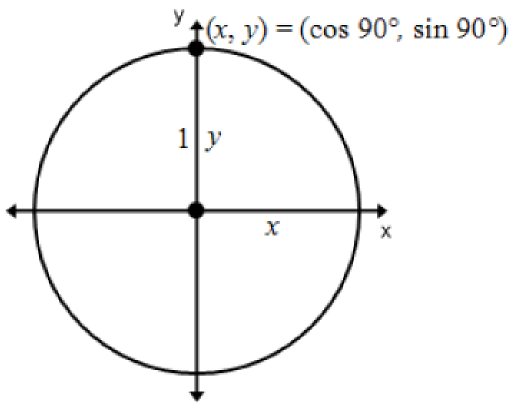

y
(x, y) = (cos 60°, sin 60°)
1
y
60°
x
x


y
(x, y) = (cos 45°, sin 45°)
1
y
45°
x
x

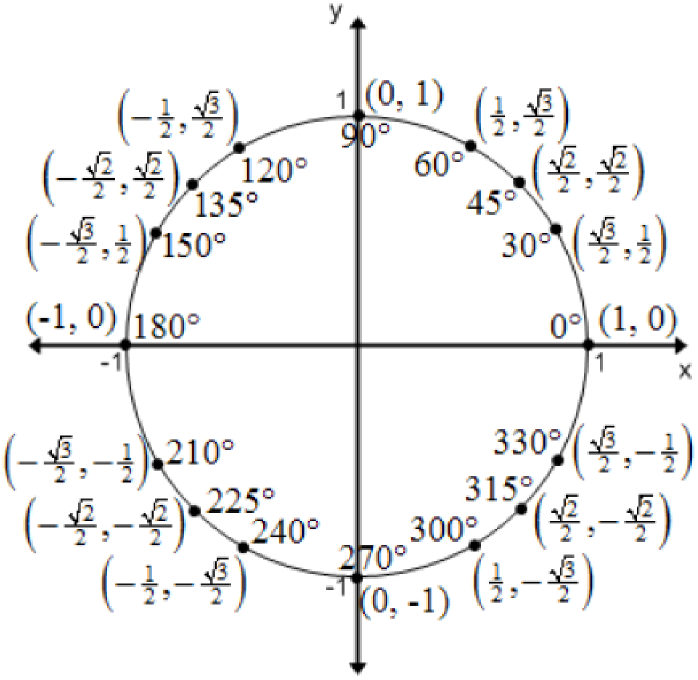
If we plot all of the points where $\theta = 30°$, $45°$, and $60°$ and their reflections, then we get most of the unit circle. To obtain the rest of the unit circle we have to examine what happens to a point when $\theta = 0°$.



Finally we need to observe what happens when we rotate a point $90°$ from the positive x-axis.



Plotting all these points, we get the Unit Circle



Finding Tangents with the unit circle

Another way to write $\tan\theta$ is $\tan\theta = \dfrac{\sin\theta}{\cos\theta}$. $= \dfrac{y}{x}$

Find $\tan\dfrac{7\pi}{6}$. $= \dfrac{+\frac{1}{\cancel{2}}}{+\frac{\sqrt{3}}{\cancel{2}}} = \dfrac{1}{\sqrt{3}} \cdot \dfrac{\sqrt{3}}{\sqrt{3}} = \boxed{\dfrac{\sqrt{3}}{3}}$

$$\frac{\frac{opp}{hyp}}{\cancel{\frac{adj}{hyp}}} \qquad \frac{opp}{\cancel{hyp}} \cdot \frac{\cancel{hyp}}{adj} = \frac{opp}{adj}$$

$\tan 270^\circ = \dfrac{-1}{0}$ = undefined

$\sin \frac{7\pi}{6} = -\frac{1}{2}$ $\cos \frac{7\pi}{6} = -\frac{\sqrt{3}}{2}$

$\sin\theta = y$

$\cos\theta = x$

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

$\tan\frac{7\pi}{6} = \frac{-\frac{1}{2}}{-\frac{\sqrt{3}}{2}} = \frac{-1}{\cancel{2}} \cdot \frac{-\cancel{2}}{\sqrt{3}}$

$= \frac{1}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$

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

Make-up Day!