

Quiz #1 Solutions

17 total possible points; grades out of 15 points

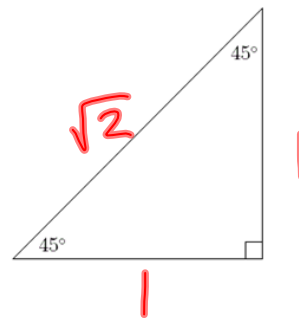
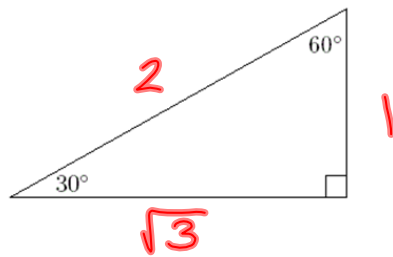
$$\frac{1}{\csc x} = \sin x$$

$$\frac{\cos x}{\sin x} = \cot x$$

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

$$\sec(90^\circ - x) = \csc x$$

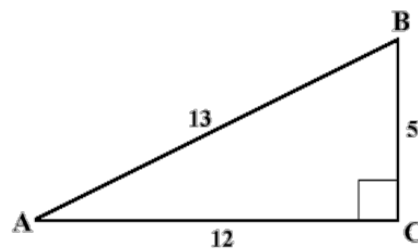
$$\cot(90^\circ - x) = \tan x$$



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

$$\cot A = \frac{12}{5}$$

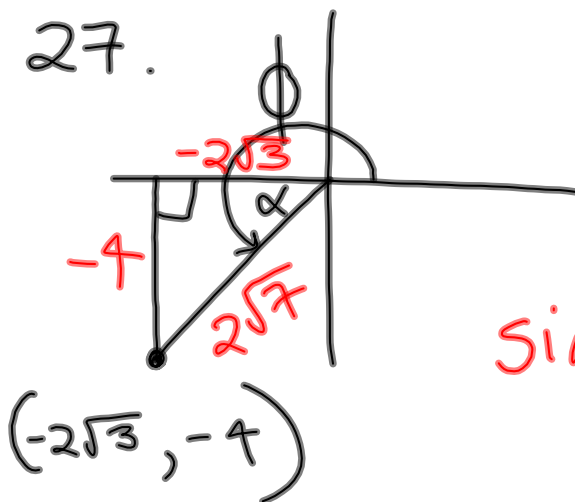
$$\sec A = \frac{13}{12}$$



Homework questions?

5.3

27.



$$h^2 = (-2\sqrt{3})^2 + (-4)^2$$

$$= 12 + 16 = 28$$

$$h = \sqrt{28} = 2\sqrt{7}$$

$$\sin \phi = \frac{-4}{2\sqrt{7}} = -\frac{2}{\sqrt{7}}$$

$$\sec \phi = \frac{2\sqrt{7}}{-2\sqrt{3}} = -\frac{\sqrt{7}}{\sqrt{3}}$$

5.3 Trigonometric Functions of Any Angle

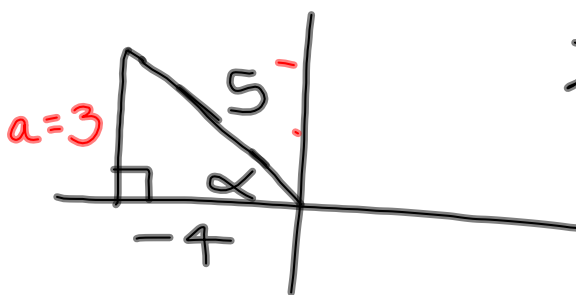
30. The terminal side of angle θ lies along the line $4x + y = 0$ in ~~QII~~
 Find $\sin \theta$, $\cos \theta$, and $\tan \theta$.

$\sin \theta = \frac{-4}{\sqrt{17}}$
 $\cos \theta = \frac{1}{\sqrt{17}}$
 $\tan \theta = -4$

$y = -4x$

$h^2 = 1^2 + (-4)^2$
 $= 1 + 16$
 $h = \sqrt{17}$

36. Given that $\cos \alpha = -\frac{4}{5}$ and $\alpha \in QII$,
 find the other 5 trigonometric function values of α .



★ hypotenuse is always positive!

$\sin \alpha = \frac{3}{5}$ $\csc \alpha = \frac{5}{3}$
 $\cos \alpha = -\frac{4}{5}$ $\sec \alpha = -\frac{5}{4}$ $a = 3$
 $\tan \alpha = -\frac{3}{4}$ $\cot \alpha = -\frac{4}{3}$

The unit circle and function values of 30°, 45°, and 60° reference angles

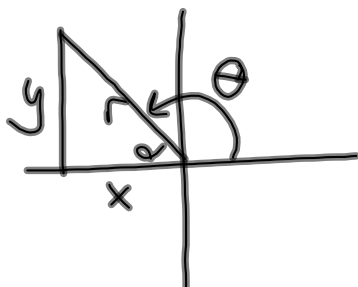
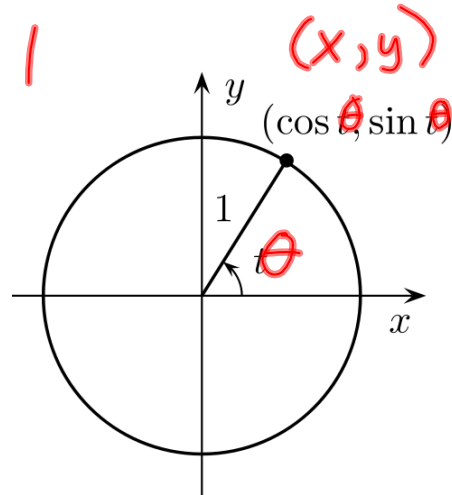
unit circle: $x^2 + y^2 = 1$

radius $r = 1$

center: $(0, 0)$

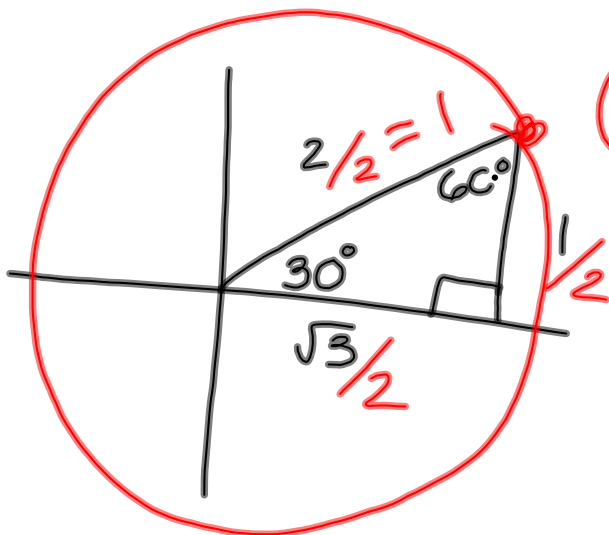
$(x-h)^2 + (y-k)^2 = r^2$

center: (h, k) ; radius: r



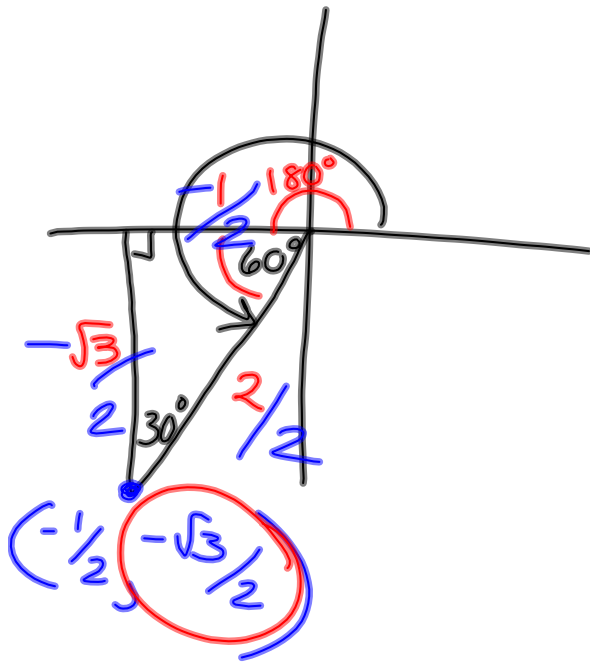
$\sin \theta = \frac{y}{r}$ $y = r \sin \theta$

$\cos \theta = \frac{x}{r}$ $x = r \cos \theta$



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

$(\cos 30^\circ, \sin 30^\circ)$



240°

$\sin 240^\circ = ?$

$-\frac{\sqrt{3}}{2}$

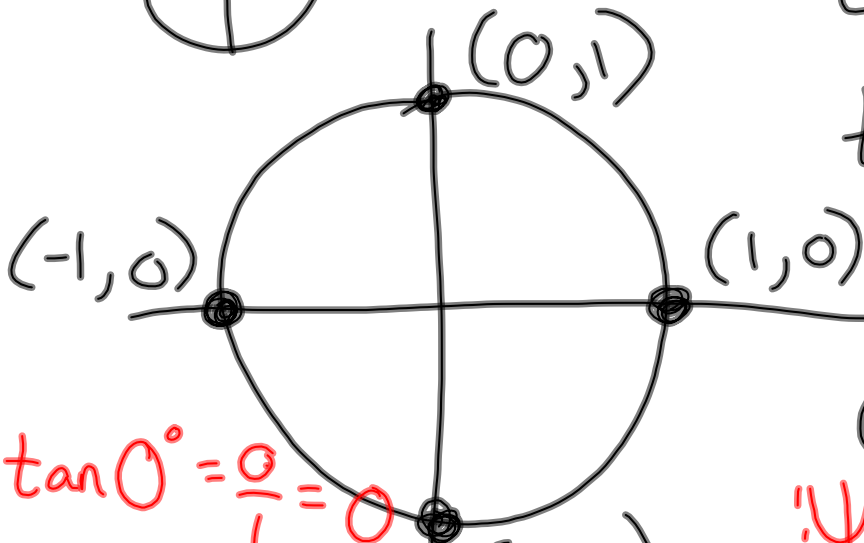
What about quadrantal angles?



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

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

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

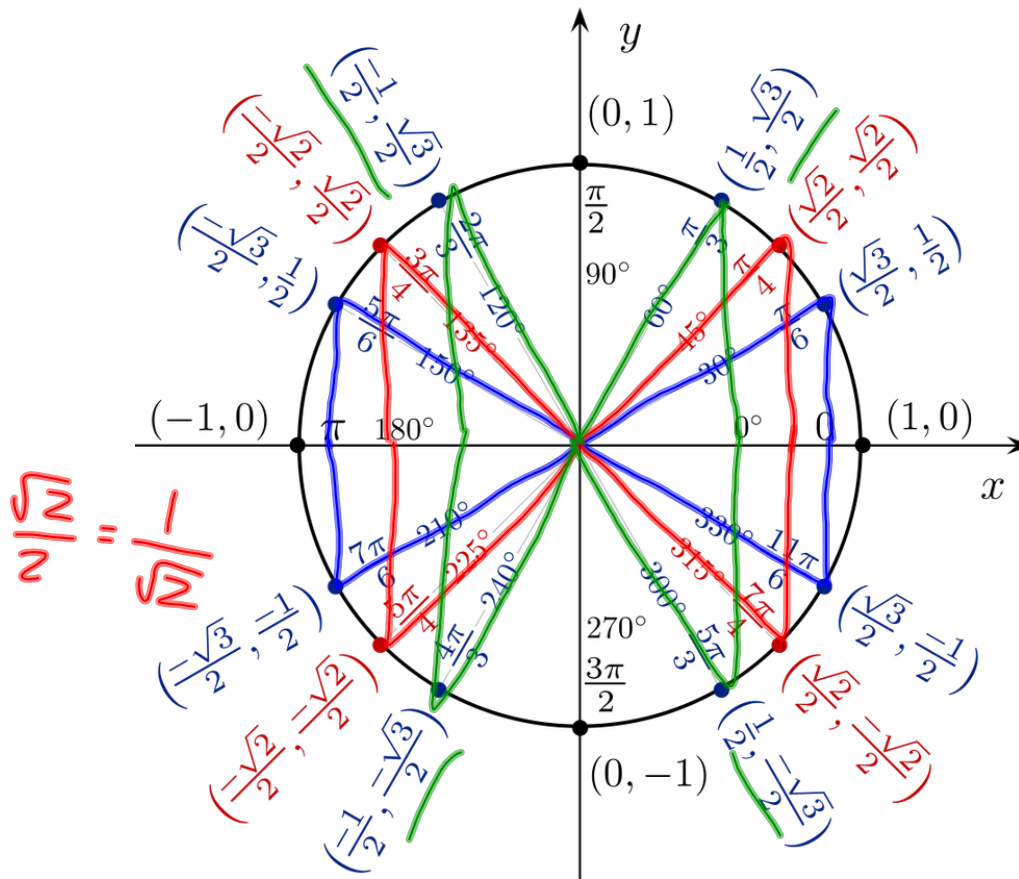


$\cot \theta = \frac{\cos \theta}{\sin \theta}$

$\tan 0^\circ = \frac{0}{1} = 0$

$\sec 270^\circ = \frac{1}{0}$ undefined

$\frac{0}{n} = 0$
 $\frac{n}{0} = \text{undefined}$



All Students Take Calculus



$$x = \cos \theta$$

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

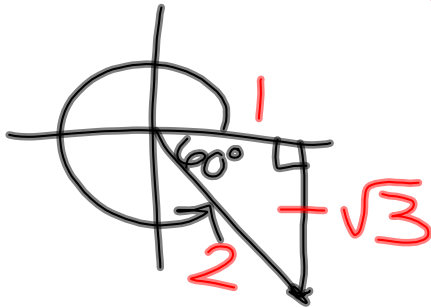
$$y = \sin \theta$$

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

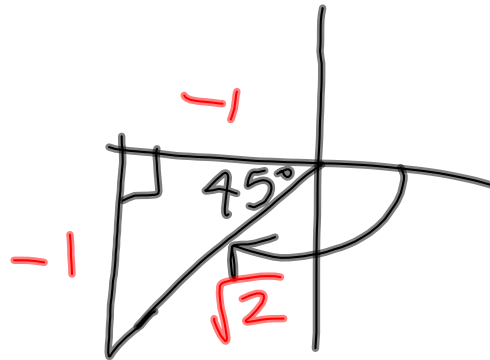
tells us which functions & their reciprocals are positive

Find the trig function value of the given angle (note that they all have either a 30°, 45°, or 60° reference angle OR are quadrantal angles).

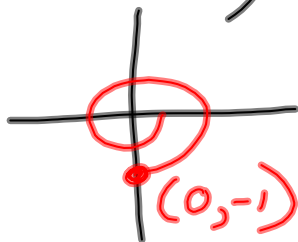
$$\tan 300^\circ = \boxed{-\sqrt{3}}$$



$$\sec(-135^\circ) = -\sqrt{2}$$



$$\sin(-450^\circ) = \boxed{-1}$$

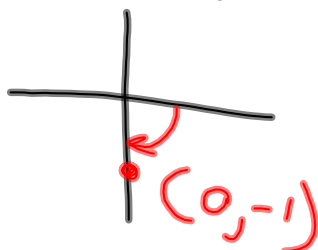


$$\csc(90^\circ) = \frac{1}{1} = \boxed{1}$$



$$\cot(-90^\circ) = \frac{0}{-1} = \boxed{0}$$

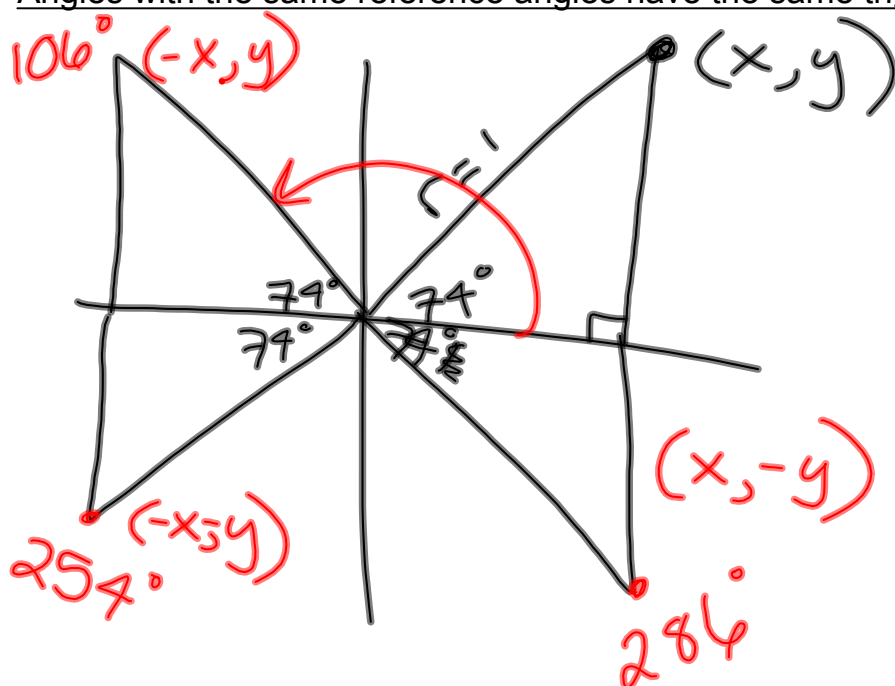
$\frac{\cos}{\sin}$



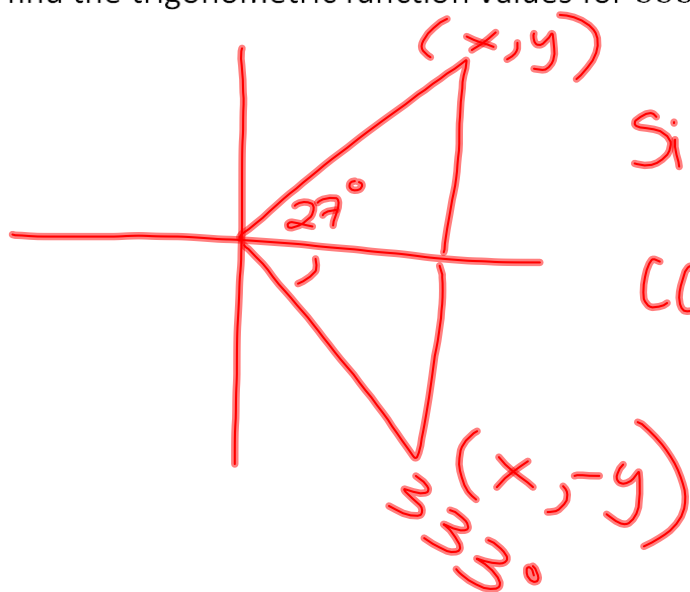
$$\cos(120^\circ) = \boxed{-\frac{1}{2}}$$



Angles with the same reference angles have the same trig function values.



80. Given that $\sin 27^\circ \approx 0.4540$, $\cos 27^\circ \approx 0.8910$, and $\tan 27^\circ \approx 0.5095$, find the trigonometric function values for 333° .



$$\sin 333^\circ = -0.4540$$

$$\cos 333^\circ = 0.8910$$

$$\tan 333^\circ = -0.5095$$

Homework: 5.3 #29-37 odd, 39-70 all; 71-81 odd

