Trig 5.3

Use the unit circle to find the values of the six trig functions

Find the (6) values of an angle in standard position given terminal side

six trig functions

standard position

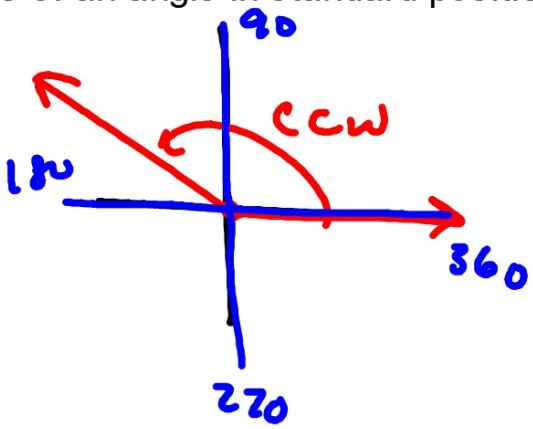
terminal side

quadrantal angles

reference angles

unit circle

circular function



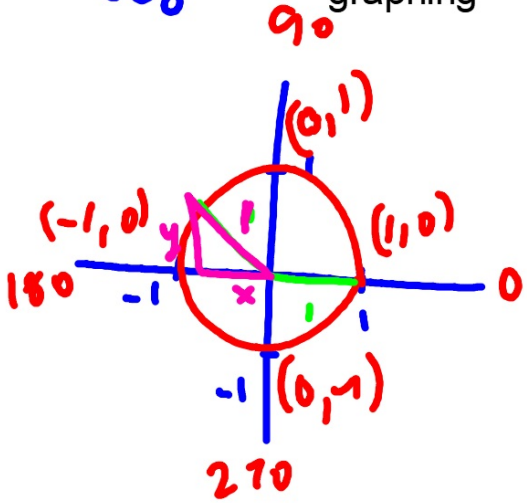
x-axis

$r = 1$

$h = 1$

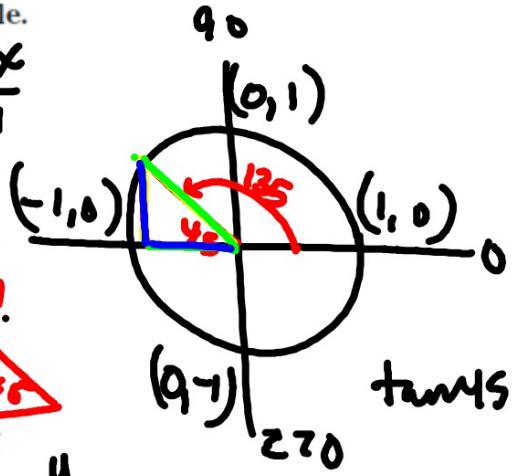
Quiz 5.1-5.2
Mon.

Floor graphing



Use reference angles
pos...neg...if not in Q1

3 Use the unit circle to find the values of the six trigonometric functions for a 135° angle.



$\cos 45 = \frac{x}{1}$

$x = \cos 45$

180

$\sin 45 = \frac{y}{1}$ $y = \sin 45$

$\tan 45 = \frac{x}{y}$

$\sin 135 = +\frac{\sqrt{2}}{2}$

$\cos 135 = -\frac{\sqrt{2}}{2}$

$\tan 135 = -1$

$\csc 135 = +\sqrt{2}$

$\sec 135 = -\sqrt{2}$

$\cot 135 = -1$

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

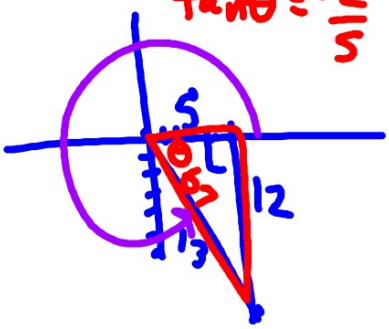
pythagorean theorem
what quadrant?
Is it on the unit circle?

4 **Find the values of the six trigonometric functions for angle θ in standard position if a point with coordinates $(5, -12)$ lies on its terminal side.**

$\theta = ? \; 293^\circ$

What does the triangle look like?

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



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

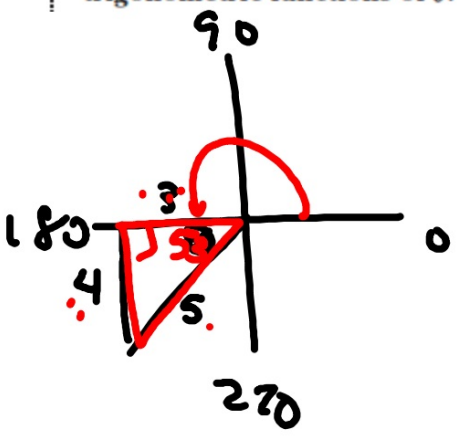
$\cos\theta = +\frac{5}{13}$ $\quad \sec\theta = +\frac{13}{5}$

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

$\tan\left(\frac{4}{3}\right)$

One picture is worth 1000 words...

5 Suppose θ is an angle in standard position whose terminal side lies in Quadrant III. If $\sin\theta = -\frac{4}{5}$, find the values of the remaining five trigonometric functions of θ.



$\frac{O}{h} \quad \frac{-4}{5}$ $\theta = 223^\circ$

$\sin\theta = -\frac{4}{5}$ $\quad \csc\theta = -\frac{5}{4}$

$\cos\theta = -\frac{3}{5}$ $\quad \sec\theta = -\frac{5}{3}$

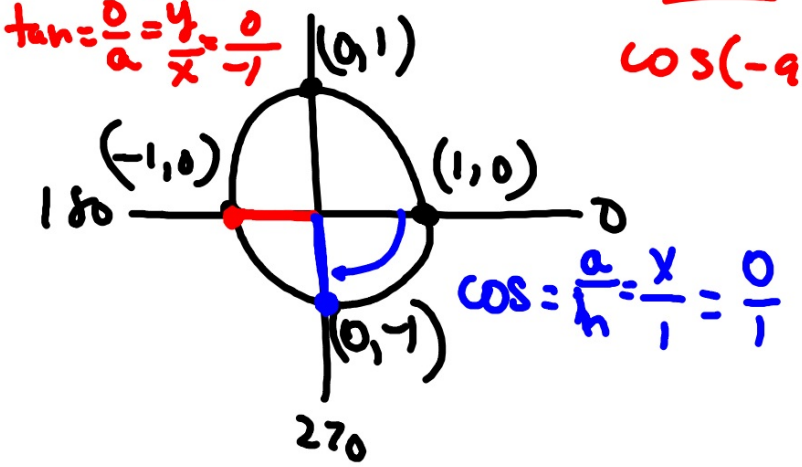
$\tan\theta = +\frac{4}{3}$ $\quad \cot\theta = +\frac{3}{4}$

Use landmarks (x,y) if quadrant lines

Use the unit circle to find each value.

5. tan 180° $= \frac{0}{-1} = 0$

6. sec (−90°) $= \frac{1}{\cos(-90)} = \frac{1}{0} =$ undef.



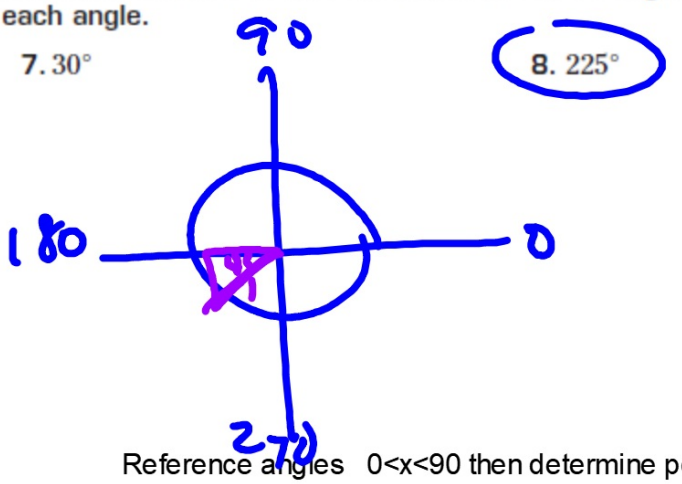
$\tan = \frac{o}{a} = \frac{y}{x} = \frac{0}{-1}$

$\cos = \frac{a}{h} = \frac{x}{1} = \frac{0}{1}$

Use the unit circle to find the values of the six trigonometric functions for each angle.

7. 30°

8. 225°



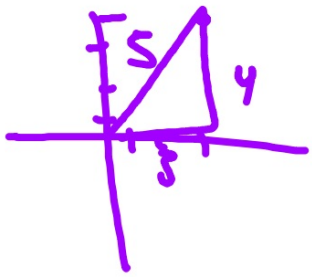
Reference angles 0<x<90 then determine positive or negative based on quadrant

Are we on the unit circle?

Find the values of the six trigonometric functions for angle θ in standard position if a point with the given coordinates lies on its terminal side.

9. $(3, 4)$

10. $(-6, 6)$



5.3

15-430

unit circle

$h = +1$