

Wednesday, February 28, 2018

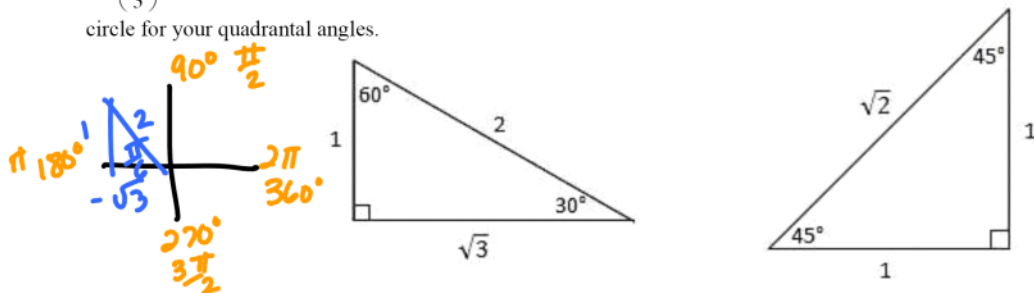
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Name: KEY

Introduction to Section 5.4

To find the sine/cosine/tangent of an angle by hand (i.e.  $210^\circ$ ,  $\frac{7\pi}{6}$ ), we have been sketching the angle in standard position, using our "bowtie," and then applying one of our special right triangles.

For this section, it may be helpful (and quicker) to memorize the sine, cosine, and tangent of each special angle:  $30^\circ$  ( $\frac{\pi}{6}$ ),  $45^\circ$  ( $\frac{\pi}{4}$ ),  $60^\circ$  ( $\frac{\pi}{3}$ ). Then you can use "All Students Take Calculus" to determine the sign of the trig function. You can still think of the unit circle for your quadrantal angles.



Angle	Reference Angle	Quadrant	Sine	Cosine	Tangent
$30^\circ$ ( $\frac{\pi}{6}$ )	$30^\circ$ , $\frac{\pi}{6}$	I	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{3}}{3}$
$45^\circ$ ( $\frac{\pi}{4}$ )	$45^\circ$ , $\frac{\pi}{4}$	I	$\frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	1
$60^\circ$ ( $\frac{\pi}{3}$ )	$60^\circ$ , $\frac{\pi}{3}$	I	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\sqrt{3}$
$120^\circ$ ( $\frac{2\pi}{3}$ )	$60^\circ$ , $\frac{\pi}{3}$	II	$\frac{\sqrt{3}}{2}$	$-\frac{1}{2}$	$-\sqrt{3}$
$135^\circ$ ( $\frac{3\pi}{4}$ )	$45^\circ$ , $\frac{\pi}{4}$	II	$\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{2}}{2}$	-1
$150^\circ$ ( $\frac{5\pi}{6}$ )	$30^\circ$ , $\frac{\pi}{6}$	II	$\frac{1}{2}$	$-\frac{\sqrt{3}}{2}$	$-\frac{\sqrt{3}}{3}$
$210^\circ$ ( $\frac{7\pi}{6}$ )	$30^\circ$ , $\frac{\pi}{6}$	III	$-\frac{1}{2}$	$-\frac{\sqrt{3}}{2}$	$\frac{\sqrt{3}}{3}$
$225^\circ$ ( $\frac{5\pi}{4}$ )	$45^\circ$ , $\frac{\pi}{4}$	III	$-\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{2}}{2}$	1
$240^\circ$ ( $\frac{4\pi}{3}$ )	$60^\circ$ , $\frac{\pi}{3}$	III	$-\frac{\sqrt{3}}{2}$	$-\frac{1}{2}$	$\sqrt{3}$
$300^\circ$ ( $\frac{5\pi}{3}$ )	$60^\circ$ , $\frac{\pi}{3}$	IV	$-\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$-\sqrt{3}$
$315^\circ$ ( $\frac{7\pi}{4}$ )	$45^\circ$ , $\frac{\pi}{4}$	IV	$-\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	-1
$330^\circ$ ( $\frac{11\pi}{6}$ )	$30^\circ$ , $\frac{\pi}{6}$	IV	$-\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$-\frac{\sqrt{3}}{3}$