

## L4 – Reciprocal Trig Ratios

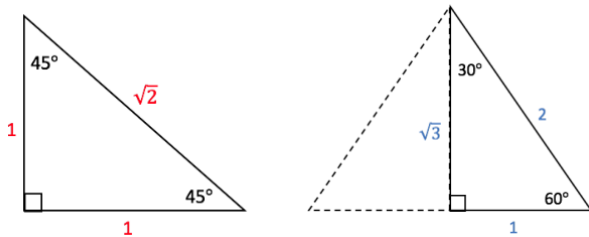
MCR3U

Jensen

The reciprocal trigonometric ratios are reciprocals of the primary trigonometric ratios, and are defined as 1 divided by each of the primary trigonometric ratios:

Primary Trig Ratios	Reciprocal Trig Ratios
$\sin\theta = \frac{\textit{opposite}}{\textit{hypotenuse}}$	$\textit{cosecant} = \frac{1}{\sin\theta} = \frac{\textit{hypotenuse}}{\textit{opposite}}$
$\cos\theta = \frac{\textit{adjacent}}{\textit{hypotenuse}}$	$\textit{secant} = \frac{1}{\cos\theta} = \frac{\textit{hypotenuse}}{\textit{adjacent}}$
$\tan\theta = \frac{\textit{opposite}}{\textit{adjacent}}$	$\textit{cotangent} = \frac{1}{\tan} = \frac{\textit{adjacent}}{\textit{opposite}}$

Don't forget your special triangles:



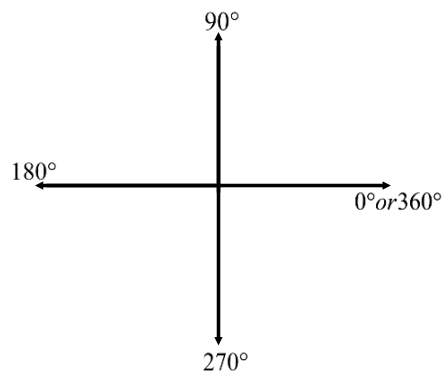
**Example 1:** Complete the following chart. Give exact values for each ratio.

	$\sin\theta$	$\csc\theta$	$\cos\theta$	$\sec\theta$	$\tan\theta$	$\cot\theta$
$0^\circ$						
$30^\circ$						
$45^\circ$						
$60^\circ$						
$90^\circ$						

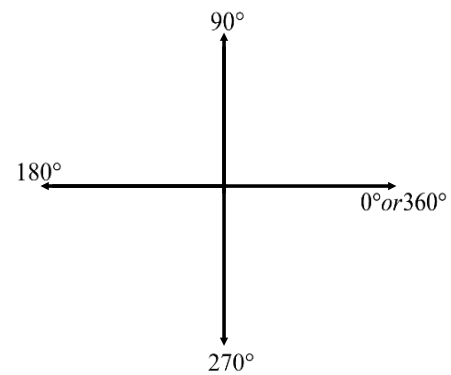
**Example 2:** The point  $(-9, 12)$  lies on the terminal arm of an angle in standard position. Determine exact expressions for the six trigonometric ratios for the angle.

**Example 3:** Solve the following equations for  $0^\circ \leq \theta \leq 90^\circ$

a)  $\csc \theta = 8$



b)  $\sec \theta = \frac{5}{2}$



**Example 4:** Solve the following equation for  $0^\circ \leq \theta \leq 360^\circ$ .

$\csc \theta + 2 = 0$

