

Exploring the Primary Trigonometric Ratios of Obtuse Angles

We are familiar with using the primary trigonometric ratios of *acute* angles. For example, we have used these ratios to determine side lengths and (acute) angle measures in right triangles. In this course, we will also be working with the primary trigonometric ratios of *obtuse* angles.

Investigate the primary trigonometric ratios of *related* acute and obtuse angles by completing the following charts:

θ	$\sin \theta$	$\cos \theta$	$\tan \theta$
100°	0.9848	-0.1736	-5.6713
120°			
140°			
160°			
180°			

$180^\circ - \theta$	$\sin(180^\circ - \theta)$	$\cos(180^\circ - \theta)$	$\tan(180^\circ - \theta)$
80°			

For any angle θ ,

$\sin \theta =$ _____ $\cos \theta =$ _____ $\tan \theta =$ _____

Example: Solve the following problem.

In an obtuse triangle, $\angle B$ measures 23.0° and its opposite side, b , has a length of 40.0 cm. Side a is the longest side of the triangle, with a length of 65.0 cm. Determine the measure of $\angle A$ to the nearest tenth of a degree.

