

L2 – 4.2 Trig Ratios and Special Angles

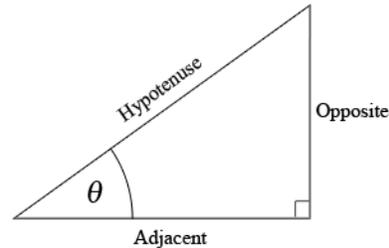
MHF4U

Jensen

Part 1: Review of Last Year Trig

What is SOHCAHTOA?

If we know a right angle triangle has an angle of θ , all other right angle triangles with an angle of θ are _____ and therefore have equivalent ratios of corresponding sides. The three primary ratios are shown in the diagram to the right.



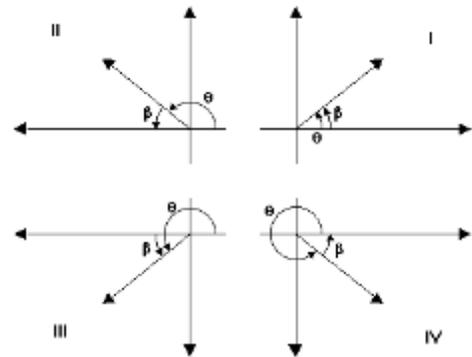
$$\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\cos \theta = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\tan \theta = \frac{\text{opposite}}{\text{adjacent}}$$

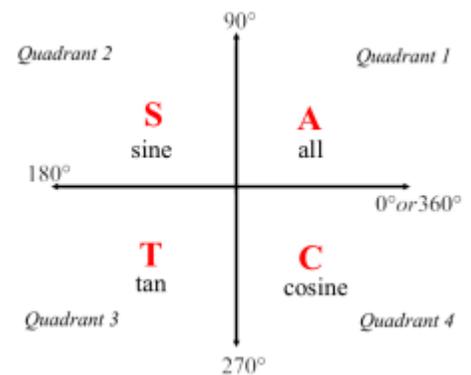
What is a reference angle?

Any angle over 90° has a **reference angle**. The reference angle is between 0° and 90° and helps us determine the exact trig ratios when we are given an obtuse angle (angle over 90°). The reference angle is the angle between the terminal arm and the _____ ($0/360$ or 180).



What is the CAST rule?

When finding the trig ratios of positive angles, we are rotating counter clockwise from 0 degrees toward 360 . The **CAST rule** helps us determine which trig ratios _____ in each **quadrant**



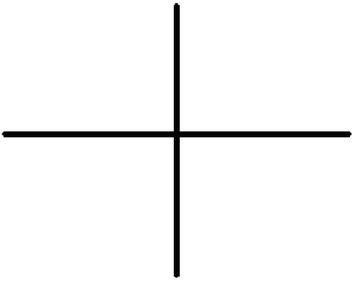
Note: There are multiple angles that have the same trig ratio. You can use reference angles and the cast rule to find them.

Part 2: Finding Exact Trig Ratios for Special Angles

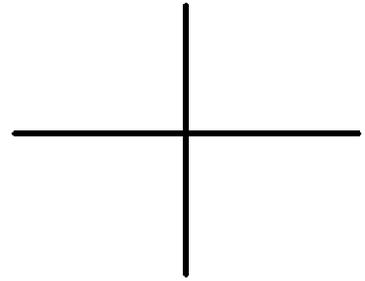
Start by drawing both special triangles using radian measures

Example 1: Find the exact value for each given trig ratio.

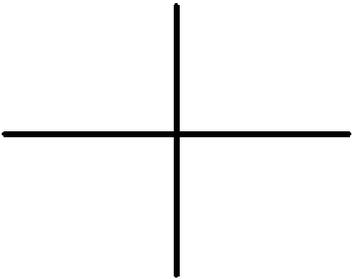
a) $\tan \frac{11\pi}{6}$



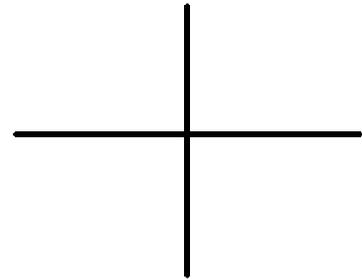
b) $\sin \frac{5\pi}{6}$



c) $\cos \frac{5\pi}{4}$



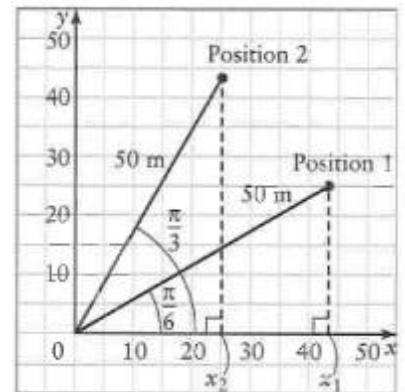
d) $\sec \frac{3\pi}{4}$



Example 2: Find the value of all 6 trig ratios for $\frac{5\pi}{3}$

Part 3: Application Question

Example 3: Justin is flying a kite at the end of a 50-m string. The sun is directly overhead, and the string makes an angle of $\frac{\pi}{6}$ with the ground. The wind speed increases, and the kite flies higher until the string makes an angle of $\frac{\pi}{3}$ with the ground. Determine an exact expression for the horizontal distance between the two positions of the kite along the ground.



The horizontal distance between the two kites =