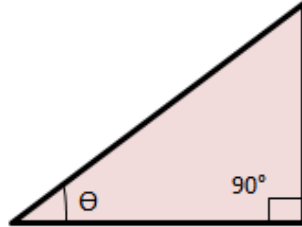


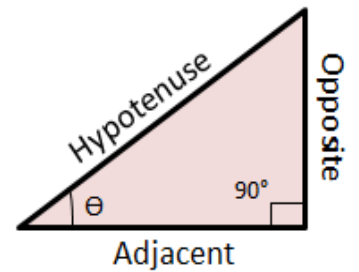
Trigonometry Guide Notes

A **Right-angled triangle (named as right triangle)** is a triangle which has one of its angles equal to 90 degrees.



There are properties associated with a right triangle.

- A **hypotenuse** is the line segment opposite to the right-angle.
- An **opposite** is the line segment opposite to the angle θ .
- An **adjacent** is the line segment next to the angle θ .



Trigonometric Ratios

There are three basic trigonometric ratios:

1. Sine

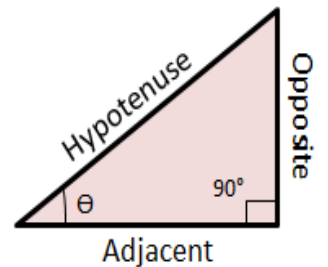
$$\sin(\theta) = \frac{\text{opposite}}{\text{hypotenuse}}$$

2. Cosine

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

3. Tangent

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



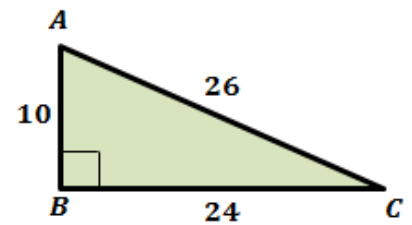
Trigonometry Guide Notes

Problem 1: Write the trigonometric ratios $\sin(C)$, $\cos(C)$ and $\tan(C)$ for the triangle shown.

$$\Rightarrow \sin(C) = \frac{10}{26} = \frac{5}{13}$$

$$\Rightarrow \cos(C) = \frac{24}{26} = \frac{12}{13}$$

$$\Rightarrow \tan(C) = \frac{10}{24} = \frac{5}{12}$$



Reciprocal Trigonometric Ratios

Each of the three trigonometric ratios has a reciprocal ratio:

1. Cosecant

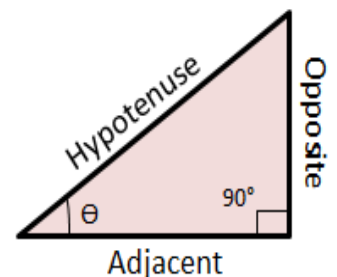
$$\text{cosec}(\theta) = \frac{\text{hypotenuse}}{\text{opposite}} = \frac{1}{\sin(\theta)}$$

2. Secant

$$\text{sec}(\theta) = \frac{\text{hypotenuse}}{\text{adjacent}} = \frac{1}{\cos(\theta)}$$

3. Cotangent

$$\text{cot}(\theta) = \frac{\text{adjacent}}{\text{opposite}} = \frac{1}{\tan(\theta)}$$



Trigonometry Guide Notes

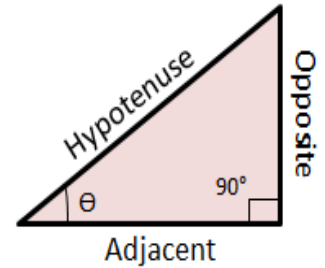
Inverse of Trigonometric Ratios

The inverse of a trigonometric ratio can be used to find the unknown angles in a right triangle.

$$\theta = \sin^{-1}\left(\frac{\textit{opposite}}{\textit{hypotenuse}}\right)$$

$$\theta = \cos^{-1}\left(\frac{\textit{adjacent}}{\textit{hypotenuse}}\right)$$

$$\theta = \tan^{-1}\left(\frac{\textit{opposite}}{\textit{adjacent}}\right)$$



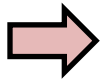
Problem 2: Find the value of x . Round to the nearest degree.

We know that:

$$\tan(\theta) = \frac{\textit{opposite}}{\textit{adjacent}}$$



$$\theta = \tan^{-1}\left(\frac{\textit{opposite}}{\textit{adjacent}}\right)$$



$$\theta = \tan^{-1}\left(\frac{18}{6}\right)$$

$$\theta = \tan^{-1}(3)$$

$$\theta = 71.6^\circ$$

