

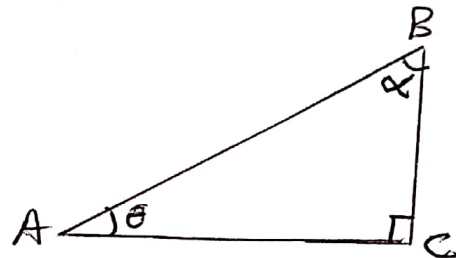
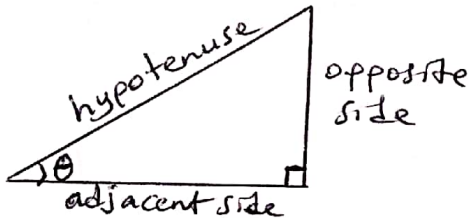
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TRIGONOMETRY

Trigonometry is a branch of mathematics that deals with the measurements of triangles.

Trigonometric ratios

Here we consider the ratios that apply to a right angled triangle



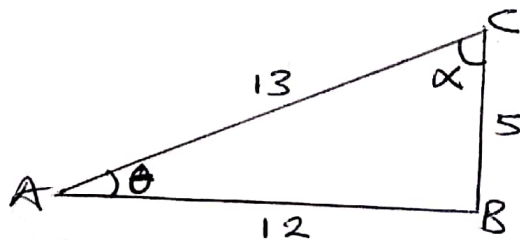
The three trigonometric ratios are called the sine ratio, the cosine ratio and the tangent ratio.

$$\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}}, \quad \cos \theta = \frac{\text{adjacent}}{\text{hypotenuse}}, \quad \tan \theta = \frac{\text{opposite}}{\text{adjacent}}$$

We use the mnemonic SOH CAH TOA to memorise these ratios.

Example

Given $\triangle ABC$ in the diagram below, find the values of $\sin \theta$, $\cos \theta$, $\tan \theta$, $\sin \alpha$, $\cos \alpha$ and $\tan \alpha$.



Solution

$$\sin \theta = \frac{\text{opp}}{\text{hyp}} = \frac{5}{13}$$

$$\cos \theta = \frac{\text{adj}}{\text{hyp}} = \frac{12}{13}$$

$$\tan \theta = \frac{\text{opp}}{\text{adj}} = \frac{5}{12}$$

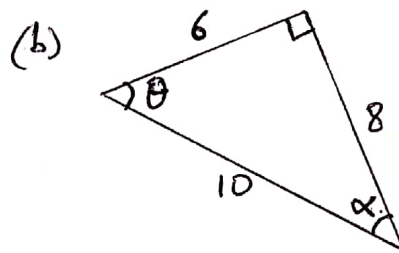
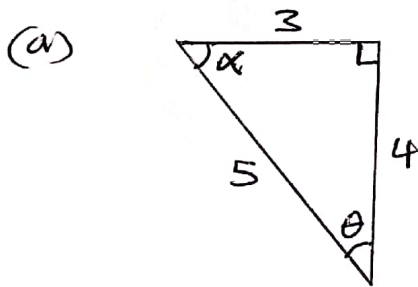
$$\sin \alpha = \frac{\text{opp}}{\text{hyp}} = \frac{12}{13}$$

$$\cos \alpha = \frac{\text{adj}}{\text{hyp}} = \frac{5}{13}$$

$$\tan \alpha = \frac{\text{opp}}{\text{adj}} = \frac{12}{5}$$

Exercise

1. Write down the values of $\sin \theta$, $\cos \theta$, $\tan \theta$, $\sin \alpha$, $\cos \alpha$ and $\tan \alpha$ for each triangle below.



2. Write down the ratios for $\sin \theta$, $\cos \theta$, $\tan \theta$, $\sin \alpha$, $\cos \alpha$ and $\tan \alpha$ for each triangle below.

