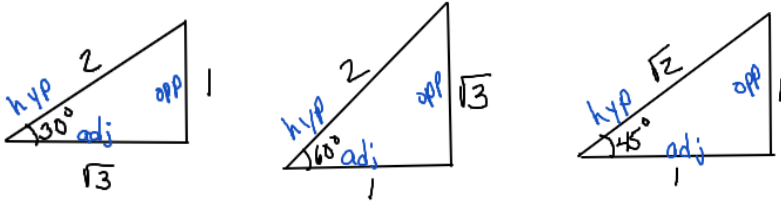
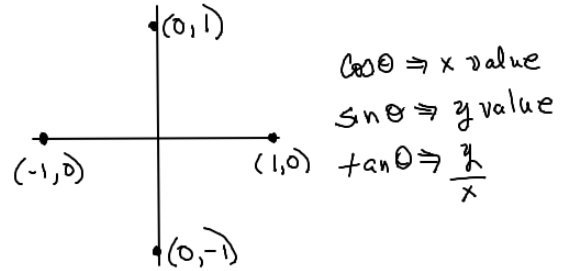


# Trigonometry Formula Sheet

(Soh cah toa)

$$\cos \theta = \frac{\text{adj}}{\text{hyp}} \quad \sin \theta = \frac{\text{opp}}{\text{hyp}} \quad \tan \theta = \frac{\text{opp}}{\text{adj}}$$

$$\sec \theta = \frac{\text{hyp}}{\text{adj}} \quad \csc \theta = \frac{\text{hyp}}{\text{opp}} \quad \cot \theta = \frac{\text{adj}}{\text{opp}}$$



## Reciprocal Identities

$\tan \theta = \frac{\sin \theta}{\cos \theta}$	$\cot \theta = \frac{\cos \theta}{\sin \theta}$	$\sec \theta = \frac{1}{\cos \theta}$	$\csc \theta = \frac{1}{\sin \theta}$	$\cot \theta = \frac{1}{\tan \theta}$
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## Pythagorean Identities

$\sin^2 \theta + \cos^2 \theta = 1$	$\tan^2 \theta + 1 = \sec^2 \theta$	$1 + \cot^2 \theta = \csc^2 \theta$
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## Sign Identities

Odd	Even	Odd
$\sin(-\theta) = -\sin \theta$	$\cos(-\theta) = \cos \theta$	$\tan(-\theta) = -\tan \theta$
$\csc(-\theta) = -\csc \theta$	$\sec(-\theta) = \sec \theta$	$\cot(-\theta) = -\cot \theta$

## Addition Formulas

$\sin(\alpha + \beta) = \sin \alpha \cos \beta + \cos \alpha \sin \beta$	$\sin(\alpha - \beta) = \sin \alpha \cos \beta - \cos \alpha \sin \beta$
$\cos(\alpha + \beta) = \cos \alpha \cos \beta - \sin \alpha \sin \beta$	$\cos(\alpha - \beta) = \cos \alpha \cos \beta + \sin \alpha \sin \beta$
$\tan(\alpha + \beta) = \frac{\tan \alpha + \tan \beta}{1 - \tan \alpha \tan \beta}$	$\tan(\alpha - \beta) = \frac{\tan \alpha - \tan \beta}{1 + \tan \alpha \tan \beta}$

## Double Angle Identities

$$\sin(2\theta) = 2 \sin \theta \cos \theta \quad \cos(2\theta) = \cos^2 \theta - \sin^2 \theta$$

$$= 2\cos^2 \theta - 1$$

$$\tan(2\theta) = \frac{2 \tan \theta}{1 - \tan^2 \theta}$$

$$= 1 - 2\sin^2 \theta$$

## Half angle Formulas

$$\cos^2 \theta = \frac{1}{2} (1 + \cos 2\theta)$$

$$\sin^2 \theta = \frac{1}{2} (1 - \cos 2\theta)$$