

Secant, Cosecant, Cotangent

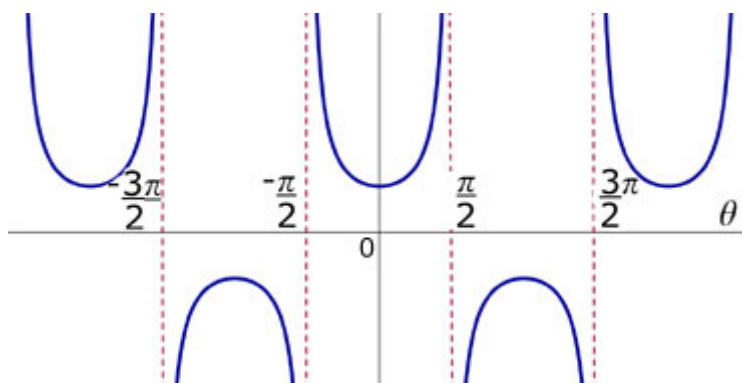
Introduction

$$\operatorname{cosec} \theta = \frac{1}{\sin \theta}$$

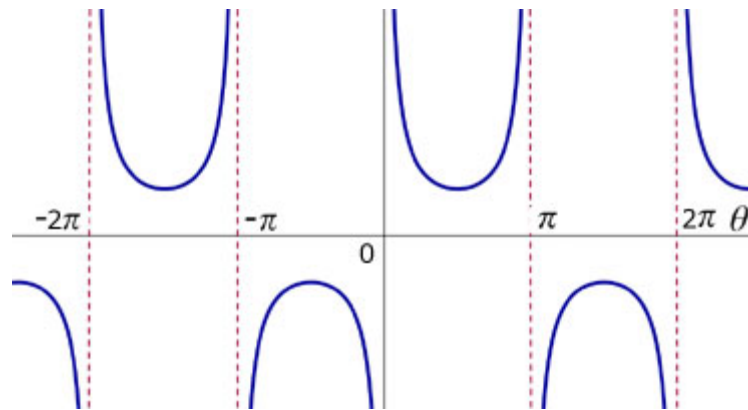
$$\sec \theta = \frac{1}{\cos \theta}$$

$$\cot \theta = \frac{1}{\tan \theta}$$

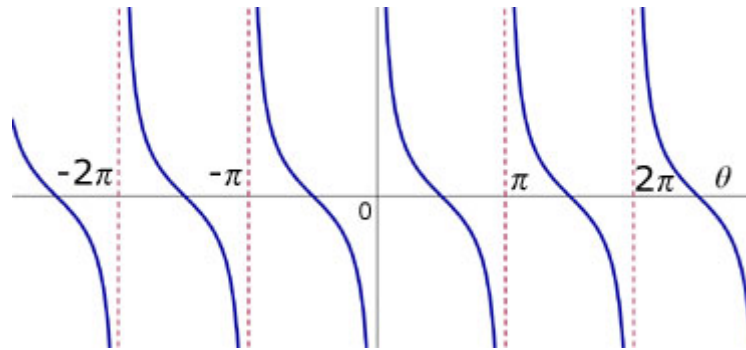
Secant (sec)



- the secant graph is symmetrical about the y-axis
- it repeats itself every **360** degrees- period 2π
- y can vary between numbers approaching infinity and minus infinity
- asymptotes start at + and - 90 degrees($\pi/2$) and at continue at intervals of 180 degrees(π) after that
- the asymptotes also correspond to the x-intercepts for $\cos(x)$
- the minima along the x-axis correspond to the maxima of the cosine function(and vice versa)

Cosecant (cosec)

- the cosecant graph is **NOT** symmetrical about the y -axis
- it repeats itself every **360** degrees - period 2π
- y can vary between numbers approaching infinity and minus infinity
- asymptotes start at zero and $+$ and $-$ 180 degrees(π) and at intervals of 180 degrees(π) after that
- the asymptotes also correspond to the x -intercepts for $\sin(x)$
- the minima along the x -axis correspond to the maxima of the sine function (and vice versa)

Cotangent (cot)

- the cotangent graph is **NOT** symmetrical about the y-axis
- it repeats itself every **180** degrees - period π
- y can vary between numbers approaching infinity and minus infinity
- asymptotes start at zero and + and - 180 degrees(π) and at intervals of 180 degrees(π) after that
- the x-asymptotes correspond to the x-intercepts of the function $y = \tan(x)$
- $y = \tan(x)$ and $y = \cot(x)$ face in opposite directions - (**tan** has a **positive gradient** while **cot** is **negative**)