

# 1. Graph Transformations of Trigonometric Functions

Sketch the following curve state the period and amplitude

$$y = \sin x$$

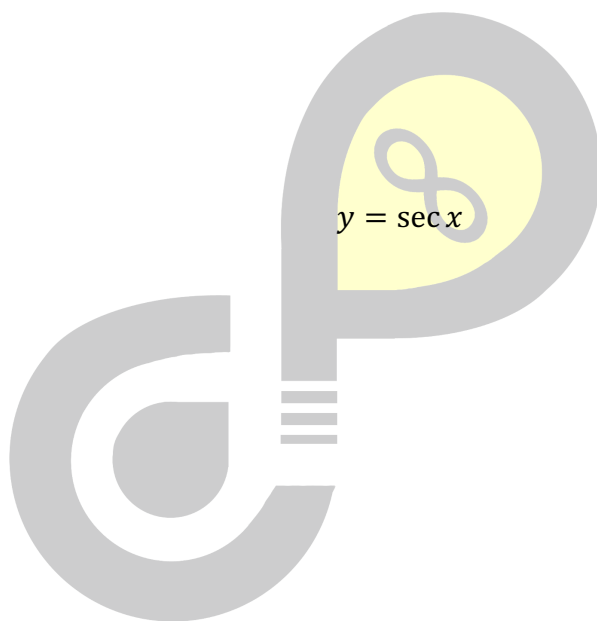
$$y = \operatorname{cosec} x$$

$$y = \cos x$$

$$y = \sec x$$

$$y = \tan x$$

$$y = \cot x$$



A. Different amplitude and Period:  $y = a \sin nx$  and  $y = a \cos nx$

Therefore, the steps of sketching the curve are:

**Step 1.** Sketch the Base function  $y = \sin x$  or  $y = \cos x$ .

**Step 2.** Label the Amplitude of the function  $y = a \sin x$  or  $y = a \cos x$ .

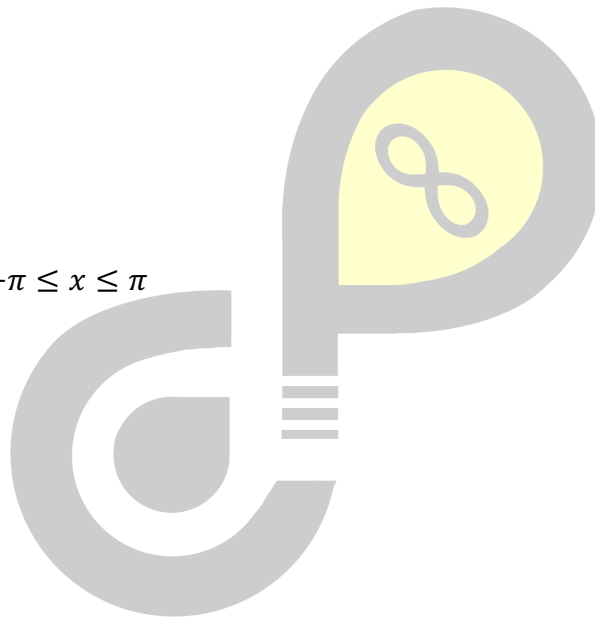
**Step 3.** Label the Period of the function using:

$$T = \frac{2\pi}{n} \text{ for } y = a \sin nx \text{ or } y = a \cos nx \text{ and } T = \frac{\pi}{n} \text{ for } y = \tan nx$$

Example.

Sketch  $y = 3 \sin 2x$  for  $0 \leq x \leq 2\pi$

Sketch  $y = 2 \cos 3x$  for  $-\pi \leq x \leq \pi$



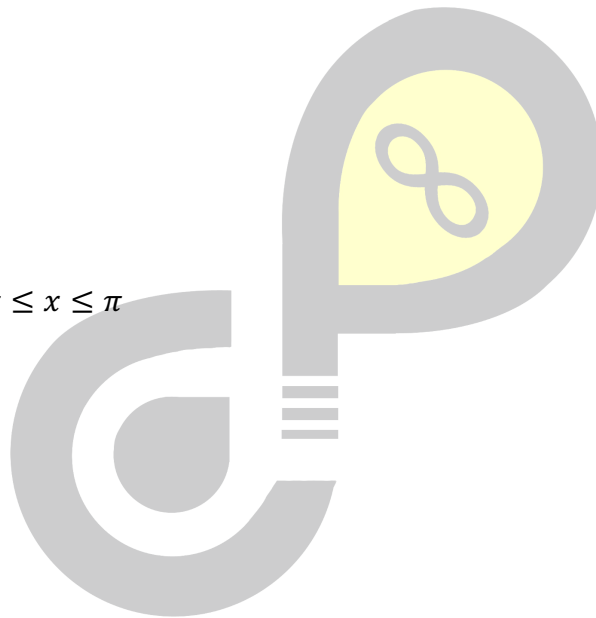
Sketch  $y = 3 \tan 2x$ ,  $-\pi \leq x \leq \pi$

Sketch  $y = -3 \cos \frac{x}{2}$  for  $0 \leq x \leq 6\pi$

Exercise

Sketch  $y = 4 \sin \frac{x}{3}$ ,  $0 \leq x \leq 3\pi$

Sketch  $y = \frac{3 \cos 2x}{2}$  for  $-\pi \leq x \leq \pi$



Sketch  $y = -2 \tan \frac{x}{2}$ ,  $0 \leq x \leq 4\pi$

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