

Graphs Of Trigonometric

Exercise 19

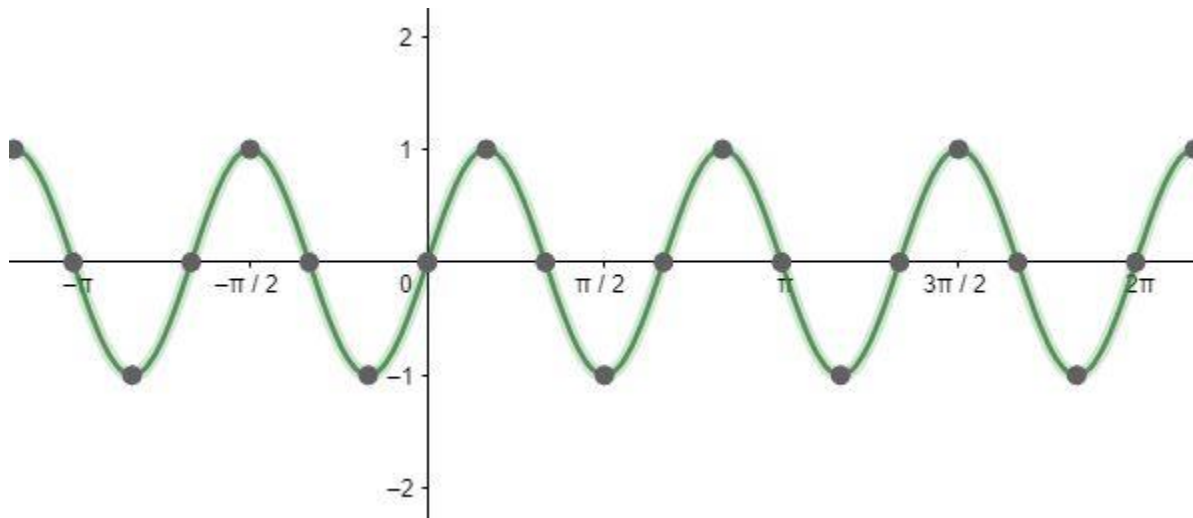
Q. 1. Draw the graph of each of the following functions:

Sin 3x

Answer : To draw the graph of the curve $\sin(3x)$ assume some standard angle measures which will help in locating the points and drawing the curve.

X	$\frac{\pi}{6}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
Sin3x	1	0	-1	0	1	0

Therefore, the graph of curve $\sin(3x)$ can be drawn as



Here, the frequency of the function $\sin(x)$ is increased by 3 times.

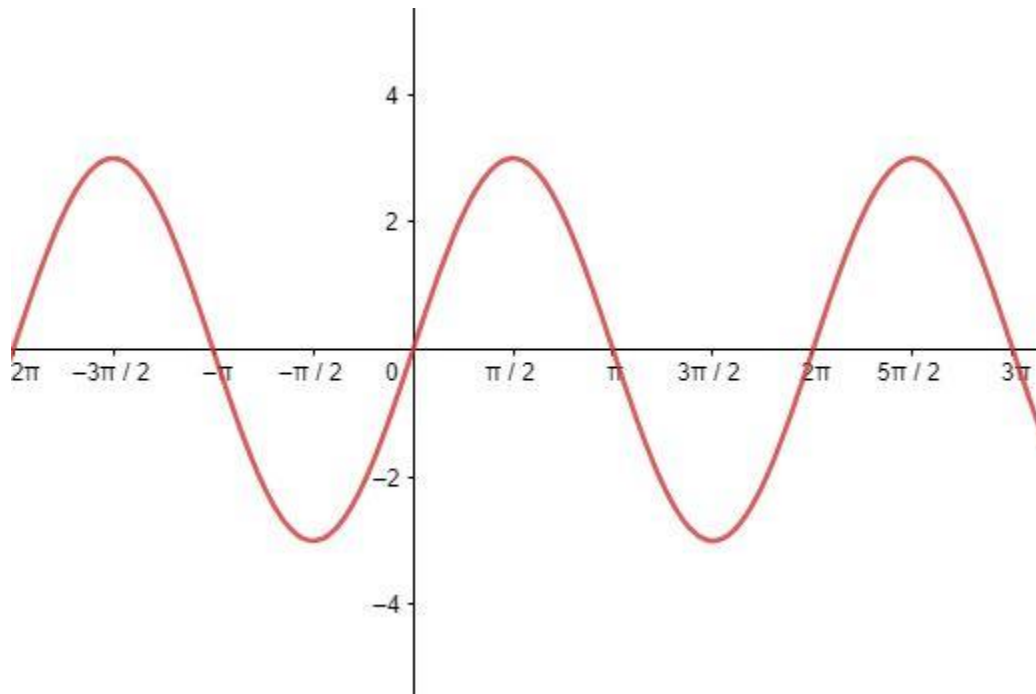
Q. 2. Draw the graph of each of the following functions:

$3\sin x$

Answer : To draw the graph of the curve $3\sin(x)$ assume some standard angle measures which will help in locating the points and drawing the curve.

X	$\frac{\pi}{6}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
$3\sin(x)$	$\frac{3}{2}$	$\frac{3\sqrt{3}}{2}$	3	0	-3	0

Therefore, the graph of curve $3\sin(x)$ can be drawn as



Here, the amplitude of the function $\sin(x)$ is increased by 3 times.

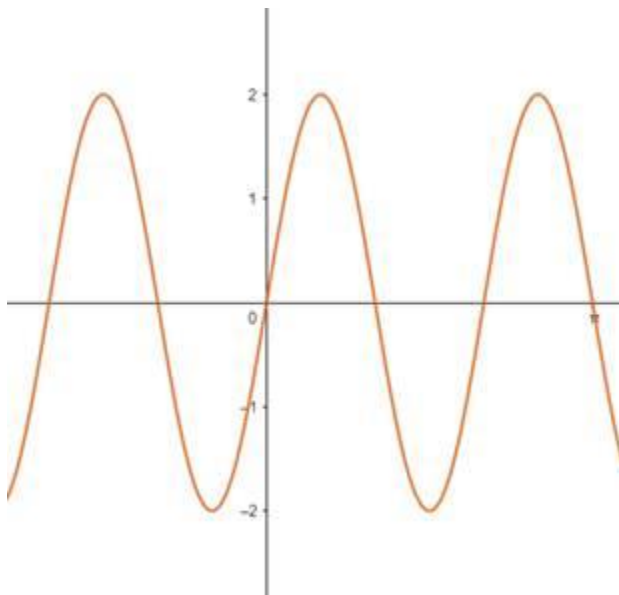
Q. 3. Draw the graph of each of the following functions:

$2\sin 3x$

Answer : To draw the graph of the curve $2\sin(3x)$ assume some standard angle measures which will help in locating the points and drawing the curve

X	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
$2\sin(3x)$	2	0	2	0

The graph looks like:



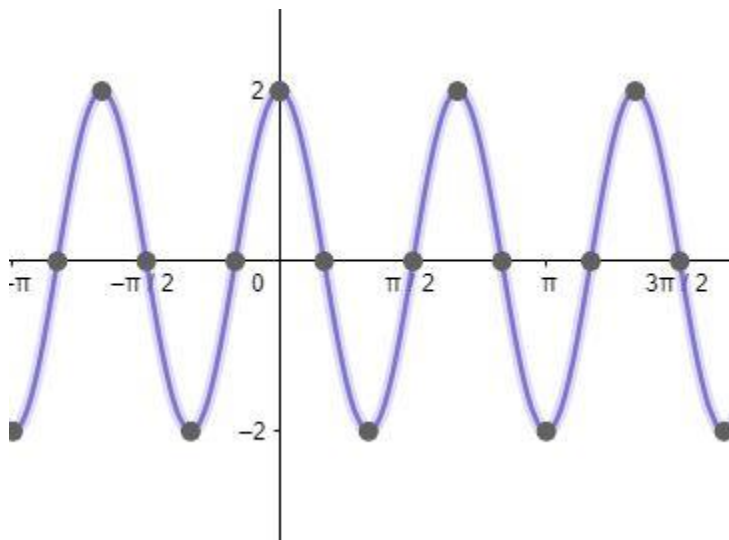
Q. 4. Draw the graph of each of the following functions:

$2\cos 3x$

Answer : To draw the graph of the curve $2\cos(3x)$ assume some standard angle measures which will help in locating the points and drawing the curve.

X	$\frac{\pi}{6}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
$2\cos(3x)$	0	-2	0	-2	0	2

Therefore, the graph of curve $2\cos(3x)$ can be drawn as



Here, the amplitude and frequency of the function $\cos(x)$ is increased by 2 and 3 times respectively.

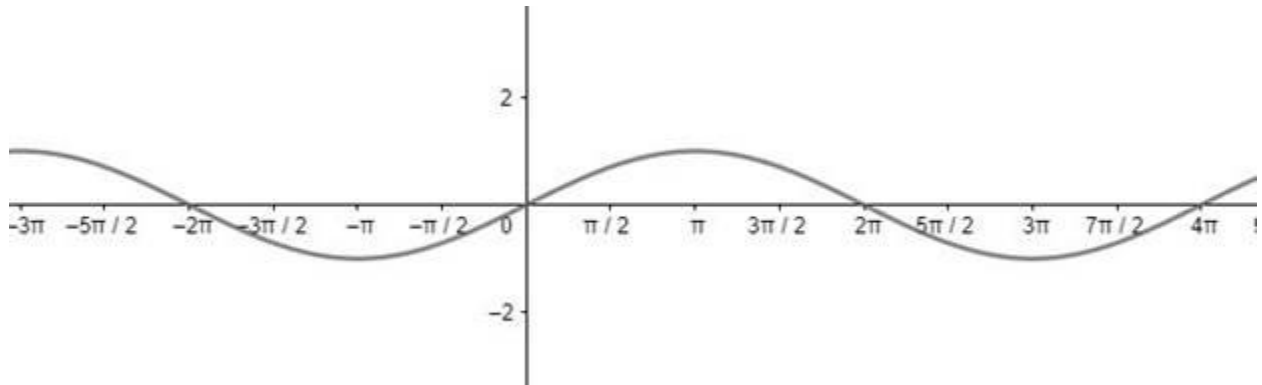
Q. 5. Draw the graph of each of the following functions:

$$\sin \frac{x}{2}$$

Answer : To draw the graph of the curve $\sin(x/2)$ assume some standard angle measures which will help in locating the points and drawing the curve.

X	$\frac{\pi}{6}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
$\sin(x/2)$	$\frac{\sqrt{3}-1}{2\sqrt{2}}$	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	1	$\frac{1}{\sqrt{2}}$	0

Therefore, the graph of curve $2\cos(3x)$ can be drawn as



Here, the frequency of the function $\sin(x)$ is decreased by 0.5 times.

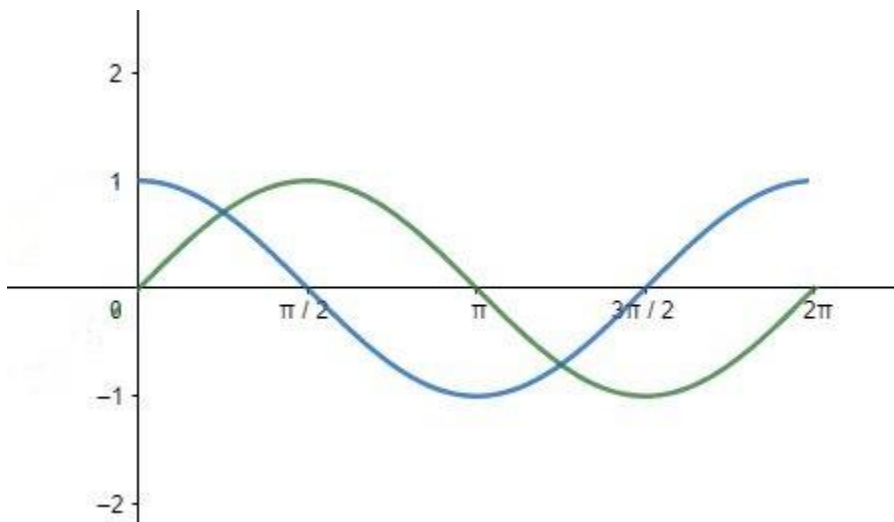
Q. 6. Draw the graphs of $y = \sin x$ and $y = \cos x$ in $[0, 2\pi]$ on the same axes.

Answer : For $\sin x$

X	$\frac{\pi}{6}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
$\sin x$	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	1	0	-1	0

For $\cos x$

x	$\frac{\pi}{6}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
$\cos x$	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	0	-1	0	1



The green line represents curve for $\sin(x)$ and blue for $\cos(x)$ for $[0, 2\pi]$.

Q. 7. Draw the graphs of $y = \cos x$ and $y = \cos 2x$ in $[0, 2\pi]$ on the same axes.

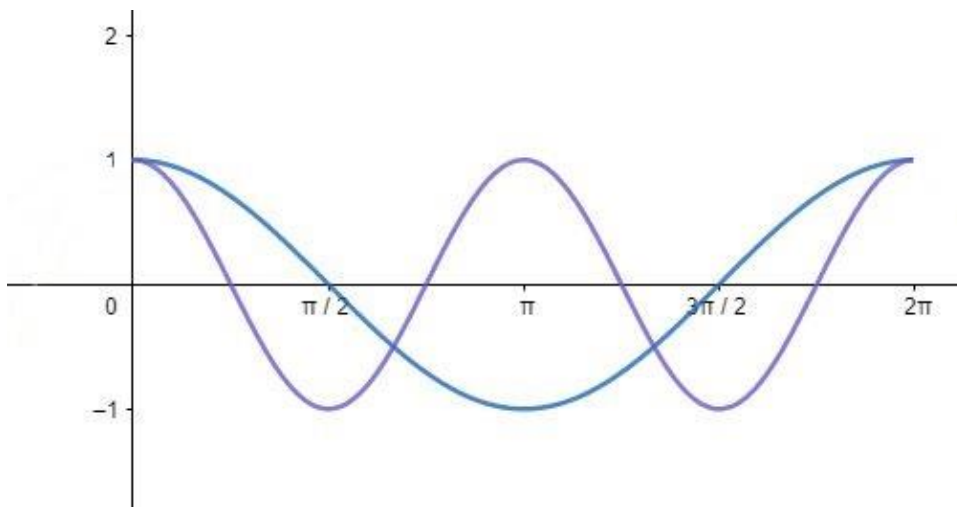
Answer : For $\cos x$

x	$\frac{\pi}{6}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
cosx	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	0	-1	0	1

For cos(2x)

x	$\frac{\pi}{6}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$	2π
Cos(2x)	$\frac{1}{2}$	$-\frac{1}{2}$	-1	1	-1	1

The graph is:-



Blue line depicts curve cos(2x)

Purple lines depict cos(x).