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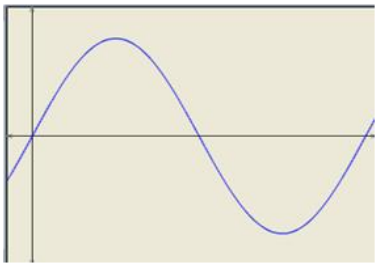
Chapter 6 Graphs of Trigonometric Functions Ex 6.1 Q1

To obtain the graph of $y = 3\sin x$ we first draw the graph of $y = \sin x$ in the interval $[0,2\pi]$. The maximum and minimum values are 3 and -3 respectively.



We have,

$$y = 2\sin\left(x - \frac{\pi}{4}\right)$$

$$\Rightarrow \quad (y - 0) = 2\sin\left(x - \frac{\pi}{4}\right)$$

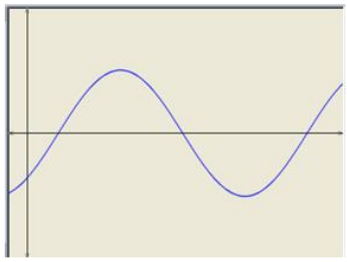
Shifting the origin at $\left(\frac{\pi}{4}, 0\right)$, we have

$$x = X + \frac{\pi}{4} \text{ and } y = Y + 0$$

Substituting these values in (i), we get

$$Y = 2\sin X$$

Thus we draw the graph of $Y = 2\sin X$ and shift it by $\frac{\pi}{4}$ to the right to get the required graph.



We have,

$$y = 2\sin(2x - 1)$$

$$\Rightarrow \quad (y - 0) = 2\sin 2\left(x - \frac{1}{2}\right)$$

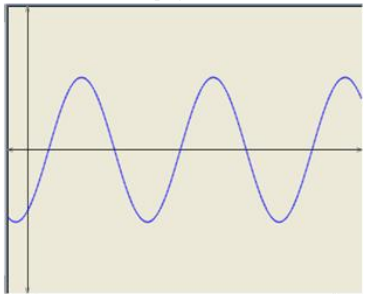
Shifting the origin at $\left(\frac{1}{2}, 0\right)$, we have

$$x = X + \frac{1}{2} \text{ and } y = Y + 0$$

Substituting these values in (i), we get

$$Y = 2\sin 2X$$

Thus we draw the graph of $Y = 2\sin 2X$ and shift it by 1/2 to the right to get the required graph.



We have,

$$y = 3\sin(3x + 1)$$

$$\Rightarrow \quad (y - 0) = 3\sin 3\left(x + \frac{1}{3}\right)$$

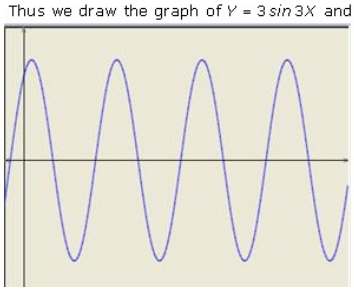
Shifting the origin at $\left(-\frac{1}{3}, 0\right)$, we have

$$x = X - \frac{1}{3} \text{ and } y = Y + 0$$

Substituting these values in (i), we get

$$Y = 3\sin 3X$$

Thus we draw the graph of $Y = 3\sin 3X$ and shift it by 1/3 to the left to get the required graph.



We have,

$$y = 3\sin\left(2x - \frac{\pi}{4}\right)$$

$$\Rightarrow \quad (y - 0) = 3\sin 2\left(x - \frac{\pi}{8}\right)$$

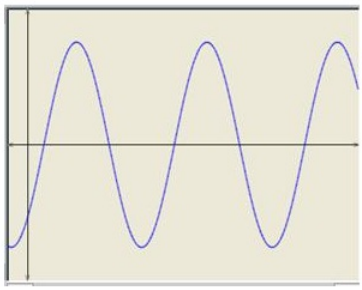
Shifting the origin at $\left(\frac{\pi}{8}, 0\right)$, we have

$$x = X + \frac{\pi}{8} \text{ and } y = Y + 0$$

Substituting these values in (i), we get

$$Y = 3\sin 2X$$

Thus we draw the graph of $Y = 3\sin 2X$ and shift it by $\frac{\pi}{8}$ to the right to get the required graph.



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