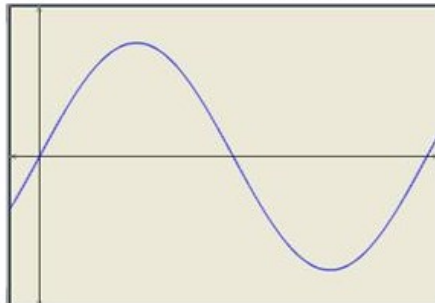


RD Sharma
Solutions
Class 11 Maths
Chapter 6
Ex 6.1

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,

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

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

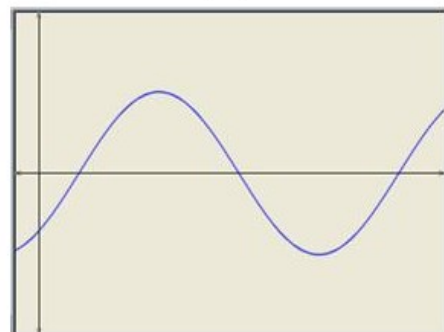
Shifting the origin at $\left(\frac{\pi}{4}, 0 \right)$, we have

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

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,

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

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

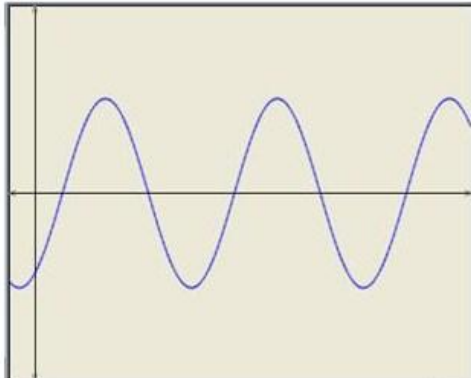
Shifting the origin at $\left(\frac{1}{2}, 0 \right)$, we have

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

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,

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

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

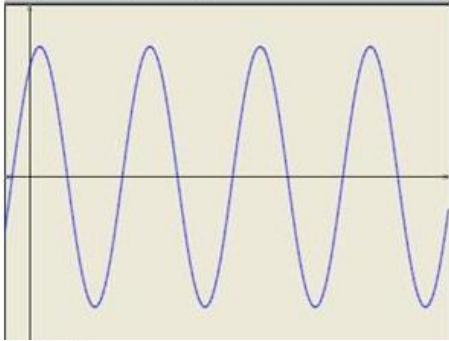
Shifting the origin at $\left(-\frac{1}{3}, 0\right)$, we have

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

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,

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

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

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

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

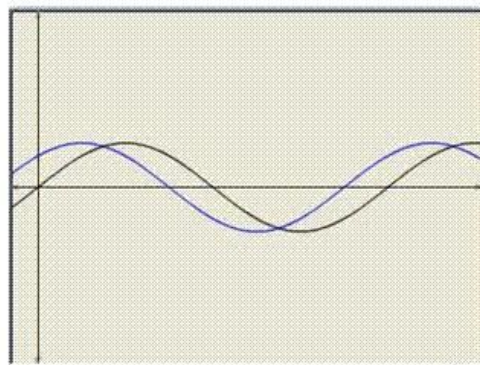
Substituting these values in (i), we get

$$Y = 3 \sin 2X$$

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.



Chapter 6 Graphs of Trigonometric Functions Ex 6.1 Q2



We have,

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

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

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

$$x = X - \frac{\pi}{4}, \quad y = Y + 0$$

Substituting these values in (i), we get

$$Y = \sin X.$$

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

To obtain the graph of $y = \sin 3x$ we first draw the graph of $y = \sin x$ in the interval $[0, 2\pi]$ and then divide the x -coordinates of the points where it crosses x -axis by 3.

