Evaluate the value of $\lim_{x\to 0}\frac{sinx}{x}$ *using series expansion*

SOLUTION :

swe know that

$$sinx = \frac{x^1}{1!} - \frac{x^3}{3!} + \frac{x^5}{5!} \dots\dots\dots\dots$$

$$\frac{sinx}{x} = 1 - \frac{x^2}{3!} + \frac{x^4}{5!} \dots\dots\dots\dots$$

$$\lim_{x\to 0}\frac{sinx}{x} = \lim_{x\to 0}(1 - \frac{x^2}{3!} + \frac{x^4}{5!} \dots\dots\dots\dots)$$

$$= 1$$

NOTE :

$$\lim_{x\to 0} x^n = 0 \quad [n > 0]$$