

d) fundamental period of f is π

e) None of the above.

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Q.4 [Descriptive question, 5 Marks]

Consider the function defined by

$f(x) = -x$, on $x \in (-\pi, 0)$, and $f(x) = x - \pi$ on $x \in [0, \pi)$.

1. Calculate the Fourier coefficients a_0, a_n and b_n , of f .
2. Hence find the value of the series $1 + \frac{1}{3^2} + \frac{1}{5^2} + \frac{1}{7^2} + \frac{1}{9^2} + \dots$

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The screenshot shows the top toolbar of the LibreOffice Writer application. The toolbar contains the following icons from left to right: Cut, Copy, Paste, Undo, Redo, Bold, Italic, Underline, Strikethrough, Bulleted List, Numbered List, Decrease Indent, Increase Indent, Paragraph Style, Styles, Format, and Help. The background of the toolbar is light gray, and the icons are arranged in a single row.

Q.5 [Descriptive Question, 5 Marks]

Consider the function $f(x) = 1$ on $(-\frac{\pi}{2}, \frac{\pi}{2})$, and $f(x) = 0$ on $[-\pi, -\frac{\pi}{2}] \cup [\frac{\pi}{2}, \pi]$. Using this function find the value of the following series:

$$\sum_{n=1}^{\infty} \frac{\sin^2(\frac{n\pi}{2})}{n^2}.$$

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The screenshot shows the LaTeX Beamer presentation editor toolbar. It includes icons for standard text editing (cut, copy, paste, undo, redo), Beamer-specific actions (ABC, Table of Contents, Section Navigation, Table of Figures, Table of Symbols, Omega, Table of Contents, Source), and formatting options (B, I, U, S, x, x^2, I_x, i, :, -, -E, ", Styles, Format, ?).

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