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EVEN AND ODDFEATURES FURE ROW FOR

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Abstract

The article goes on to think about the Fure series for even and odd functions. Example of symmetric integrals. Solutions are given.

Symmetrical integral see _

$$\int_{-l}^{l} f(x)dx = \int_{-l}^{0} f(x)dx + \int_{0}^{l} f(x)dx,$$

Wheref (x) is constant or partially continuous $[-l; l]$. First integral $x = -t$ exchange we do In that case

$dx = -dt,$

$x_н = -l = -t_н \Rightarrow t_н = l,$

$x_в = 0 = -t_в \Rightarrow t_в = 0.$

$$\int_{-l}^{l} f(x)dx = -\int_{l}^{0} f(-t)dt + \int_{0}^{l} f(x)dx = \int_{0}^{l} f(-x)dx + \int_{0}^{l} f(x)dx$$

we will have a view.

Therefore, if there is a $f(x)$dual function, then$f(-x) = f(x)$(i.e. the graph of the pair function is symmetric about the axis of the moon) and u

$$\int_{-l}^{l} f(x)dx = \int_{0}^{l} f(-x)dx + \int_{0}^{l} f(x)dx = 2\int_{0}^{l} f(x)dx$$

will be.

If there is an $f(x)$odd function, then $f(-x) = -f(x)$(i.e. the graph of the odd function is symmetric with respect to its origin) and u

$$\int_{-l}^{l} f(x)dx = \int_{0}^{l} f(-x)dx + \int_{0}^{l} f(x)dx = \int_{0}^{l} -f(x)dx + \int_{0}^{l} f(x)dx = 0$$

appears.

That is, the symmetric integral of a pair function is equal to the integral doubled in the half-interval range, and the symmetric integral of an odd function is equal to zero.

Dual and odd functions have the following two properties:

1) couple with the odd of the function multiplication is an odd function;

2) two the product of even (odd) functions is even function .

$f(x)$- given a pair of functions ,$[-\pi;\pi]$ interval is given and in this interval is divided into trigonometric Fure series. Using the above results, it follows that the coefficients of this series have the following form:

$$a_0 = \frac{2}{\pi}\int_{0}^{\pi} f(x)dx, a_n = \frac{2}{\pi}\int_{0}^{\pi} f(x) \cdot \cos nxdx, b_n = 0\ (n = 1, 2, \dots).$$

If $f(x)$- is an odd function , the $[-\pi;\pi]$interval is divided into trigonometric Fure series. It follows that the coefficients of this series have the following form:

$$a_0 = 0, a_n = 0, b_n = \frac{2}{\pi}\int_{0}^{\pi} f(x) \cdot \sin nxdx, (n = 1, 2, \dots).$$

It can be seen that the $[-\pi;\pi]$trigonometric Fure series in the range has the following appearance:

a) for a dual function :

$$\frac{a_0}{2} + \sum_{n=1}^{\infty} a_n \cos nx \qquad (1)$$

b) For an odd function :

$$\sum_{n=1}^{\infty} b_n \sin nx \qquad (2)$$

As can be seen from the above, if there is a dual function, the Fure seriescan only accept dual functions and free variables. In the case of an odd function, the Fure array only accepts odd functions.

Identification . Parts of the above

$$\frac{a_0}{2} + \sum_{n=1}^{\infty} a_n \cos nx, \sum_{n=1}^{\infty} b_n \sin nx$$

will be a complete Fure series, an incomplete trigonometric Fure series.

If$f(x)$ function to the incomplete trigonometric series (1) (or (2)) if separated , then it is in cosines (or in the sinuses)trigonometric Fure series is called .

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