QUESTION

If the Fourier series is obtained for the function $f(t)$ defined by

$$f(t) = \begin{cases} 1+t, & 0 \le t < 2, \\ t+2, & 2 \le t < 4, \end{cases} \quad \text{and } f(t+4) = f(t),$$

STATE the value of the Fourier series at $t = 2$, (you should not calculate the Fourier series).

ANSWER

$f(t)$ has a discontinuity at $t = 2$, so Fourier series at $t = 2$ converges to

$$\frac{1}{2}\{f(2^-) + f(2^+)\} = \frac{1}{2}\{(1+2) + (2+2)\} = \frac{7}{2}$$

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