Concept Question 13-4: Is the Fourier series representation given by Eq. (13.15) applicable to a periodic function that starts at $t = 0$ (and is zero for $t < 0$)?

$$f(t) = a_0 + \sum_{n=1}^{\infty} (a_n \cos n\omega_0 t + b_n \sin n\omega_0 t), \quad \text{(sine/cosine representation)} \qquad (13.15)$$

No, the Fourier series representation is for everlasting periodic functions that extend over all time. For a periodic function that starts at $t = 0$, we need to use the Laplace transform.

Table 13-6 Methods of solution.

Input $x(t)$		Solution Method	Output $y(t)$
Duration	**Waveform**		
Everlasting	**Sinusoid**	Phasor Domain	Steady-State Component (no transient exists)
Everlasting	**Periodic**	Phasor Domain and Fourier Series	Steady-State Component (no transient exists)
One-sided, $x(t) = 0$, for $t < 0^-$	**Any**	Laplace Transform (unilateral) (can accommodate nonzero initial conditions)	Complete Solution (transient + steady-state)
Everlasting	**Any**	Bilateral Laplace Transform or Fourier Transform	Complete Solution (transient + steady-state)