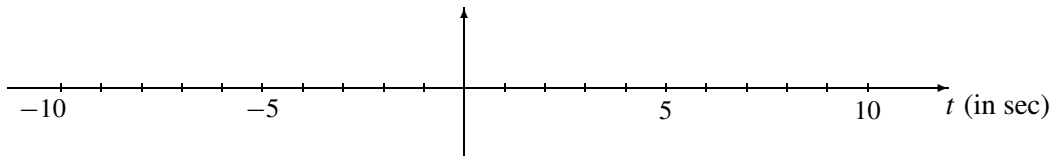


PROBLEM:

Suppose that a periodic signal is defined (over one period) as: $x(t) = \begin{cases} 1 & \text{for } 0 \leq t \leq 7 \\ 0 & \text{for } 7 < t < 8 \end{cases}$

- (a) Assume that the period of $x(t)$ is 8 s. Draw a plot of $x(t)$ over the range $-10 \leq t \leq 10$ s.



- (b) Determine the DC value of $x(t)$.
- (c) Write the Fourier integral expression for the coefficient a_3 in terms of the specific signal $x(t)$ defined above. *Set up all the specifics of the integral (e.g., limits of integration), but do not evaluate the integral. All parameters in the integral should have numeric values.*

- (d) Evaluate the following integral: $\int_0^9 e^{-j2\pi(15)t/10} dt$ Simplify your answer and express it in **polar form**.