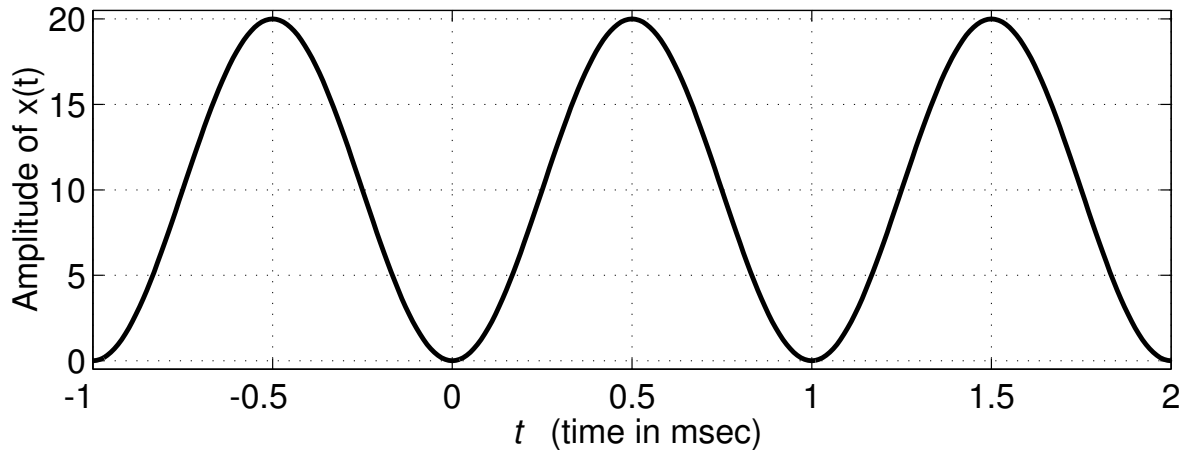


**PROBLEM:**Signal  $x(t)$  with DC Component

The above signal  $x(t)$  consists of a DC component plus a cosine signal. The terminology *DC component* means a component that is constant versus time.

- What is the frequency of the DC component? What is the frequency of the cosine component?
- Write an equation for the signal  $x(t)$ . You should be able to determine numerical values for all the amplitudes, frequencies, and phases in your equation by inspection of the above graph.
- Expand the equation obtained in the previous part into a sum of positive and negative frequency complex exponential signals.
- Plot the two-sided spectrum of the signal  $x(t)$ . Show the complex amplitudes for each positive and negative frequency contained in  $x(t)$ .