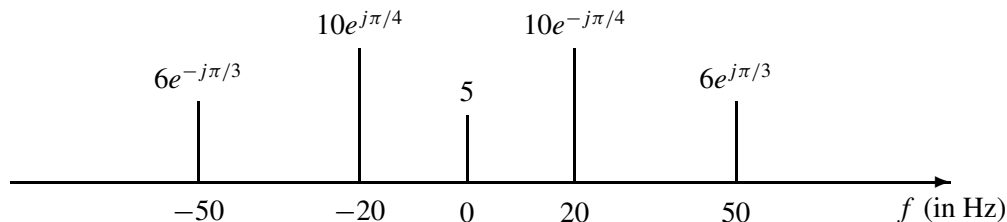


**PROBLEM:**

A signal  $x(t)$  has the two-sided spectrum representation shown below.



- Which side ( $f > 0$  or  $f < 0$ ) of the spectrum plot corresponds to complex phasors rotating in the clockwise direction?
- Write an equation for  $x(t)$  as a sum of complex rotating phasors. (These phasors may rotate clockwise, counter-clockwise or not at all.)
- Write an equation for  $x(t)$  as a sum of real functions.
- Suppose that the signal is sampled to produce the sequence  $x[n] = x(nT_s)$ , where  $f_s = 1/T_s = 200$ . Below, sketch the spectrum of the sampled signal (i.e., show the alias frequencies) as a function of both cyclic frequency  $-f_s < f < f_s$  and normalized frequency  $\hat{\omega} = 2\pi f T_s$  for normalized frequencies  $-2\pi < \hat{\omega} < 2\pi$ . Label the axis carefully. You **do not** have to write out the complex amplitude, just plot the spectral line at its correct location.

