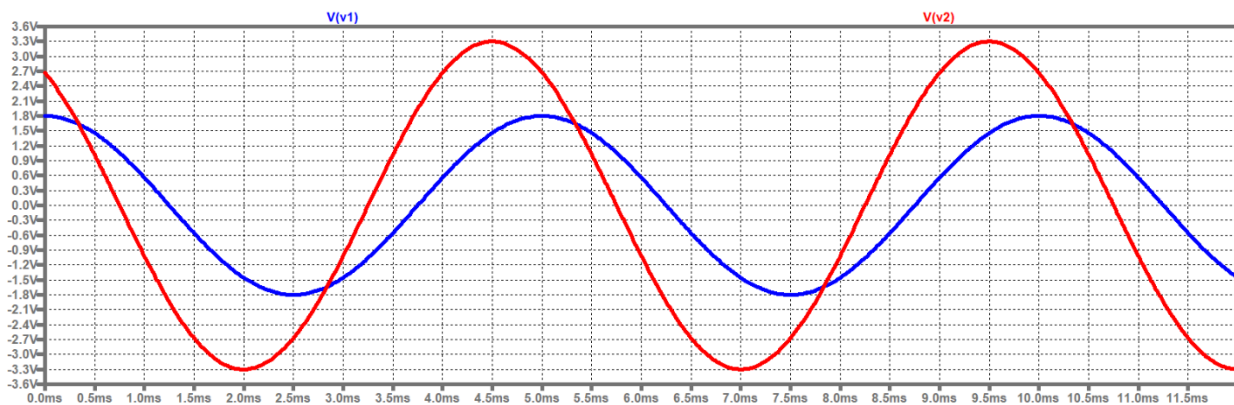


**HW18 – Due Monday, April 25**  
**EE220 – Circuits I**  
**Spring 2022**

To get full credit:

- Show your work.
- Put a box around each of your answers.
- Make sure to **follow all instructions**.

1. Two sinusoidal waveforms are plotted below. Both waveforms have the same frequency, but their amplitudes are different, and they are not in phase. **Determine the equations for  $V1$  and  $V2$  as a function of time,  $t$ .** Write your equations in terms of a cosine function, where  $V1$  has a phase of  $0^\circ$ . Which signal is leading? Which is lagging? Verify that your equations are correct by regenerating the plot below in LTspice, but run for 15ms instead. Finally, determine the phasor representation for both  $V1$  and  $V2$ . (10 points)



2. Determine the phasor representation of  $V_{in}$ ,  $V_{out}$ , and  $I$  in the circuits given below. Note that  $V_{in}$  is a cosine wave with a phase shift of  $0^\circ$  (synonymous with a sine wave with a phase shift of  $90^\circ$ ). Verify that your phasors are correct using LTspice. You can prove that your phase angle is correct by measuring the time delay between signals. (10 points)

