

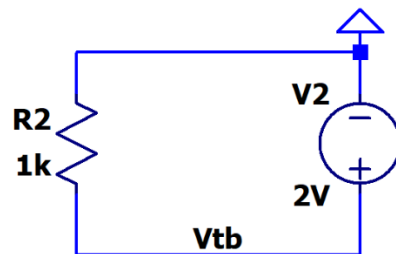
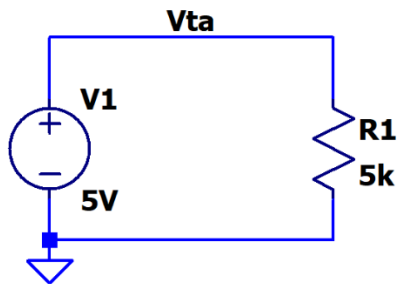
**Quiz 1 – Monday, January 24**  
**EE220 – Circuits I**  
**Spring 2022**

Name: \_\_\_\_\_

To get full credit:

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

1. Determine the voltages, **V<sub>a</sub>** and **V<sub>b</sub>**, labeled in the circuits below. Also, determine the current flowing in each of the circuits, and the direction in which the current is flowing. Label the direction of current flow using an arrow. (5 points)



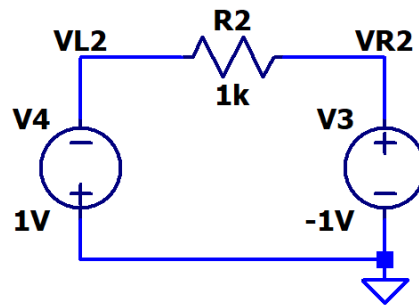
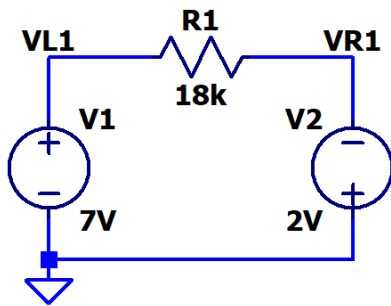
**Quiz 2 – Wednesday, January 26**  
**EE220 – Circuits I**  
**Spring 2022**

Name: \_\_\_\_\_

To get full credit:

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

1. Determine the voltages (**VL1**, **VR1** and **VL2**, **VR2**) labeled in the circuits below. Also, determine the current flowing in each circuit, and the direction in which the current is flowing. Label the direction of current flow using an arrow. (5 points)



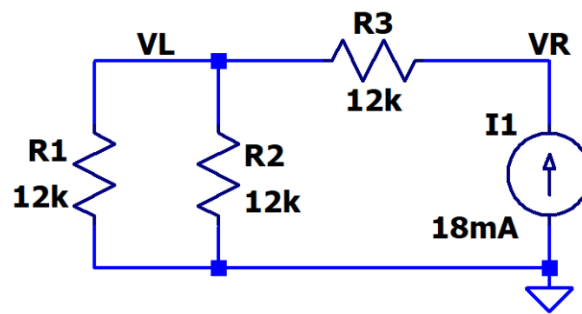
**Quiz 3 – Monday, January 31**  
**EE220 – Circuits I**  
**Spring 2022**

Name: \_\_\_\_\_

To get full credit:

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

1. Determine the voltages **VL** and **VR** labeled in the circuit below. (5 points)



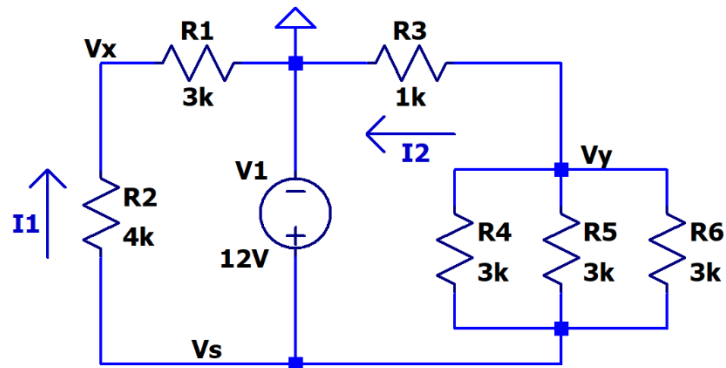
**Quiz 4 – Wednesday, February 2**  
**EE220 – Circuits I**  
**Spring 2022**

Name: \_\_\_\_\_

To get full credit:

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

1. Determine the voltages  $V_s$ ,  $V_x$ , and  $V_y$  labeled in the circuit below. Also determine the currents  $I_1$  (the current flowing through  $R_2$ ) and  $I_2$  (the current flowing through  $R_3$ ) in the direction of the arrows given. (5 points)



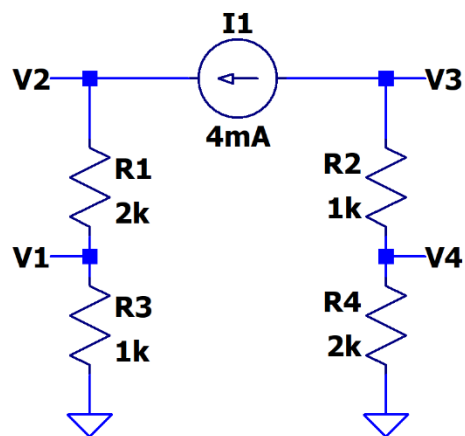
**Quiz 5 – Monday, February 7**  
**EE220 – Circuits I**  
**Spring 2022**

Name: \_\_\_\_\_

To get full credit:

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

1. Determine the voltages **V1**, **V2**, **V3** and **V4** labeled in the circuit below. (5 points)



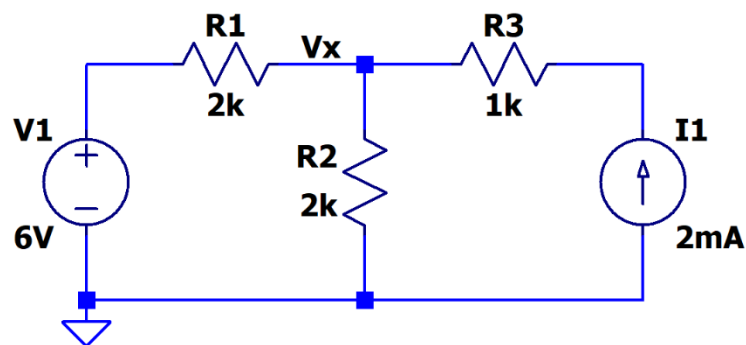
**Quiz 6 – Wednesday, February 9**  
**EE220 – Circuits I**  
**Spring 2022**

Name: \_\_\_\_\_

To get full credit:

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

1. Determine the voltage  $V_x$  labeled in the circuit below **using superposition**. (5 points)



Quiz 7 – Monday, February 14

EE220 – Circuits I

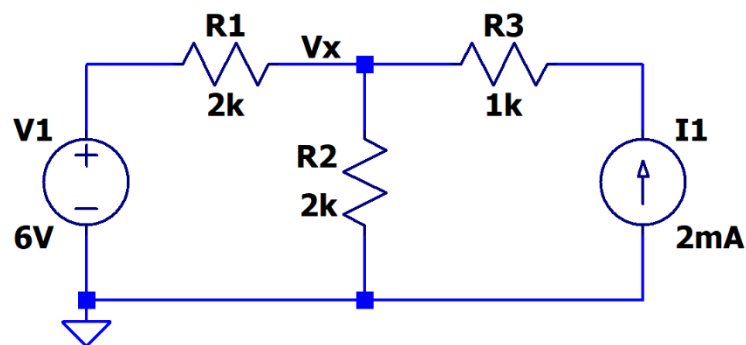
Spring 2022

Name: \_\_\_\_\_

To get full credit:

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

1. Determine the voltage  $V_x$  labeled in the circuit below **using mesh analysis**. (5 points)



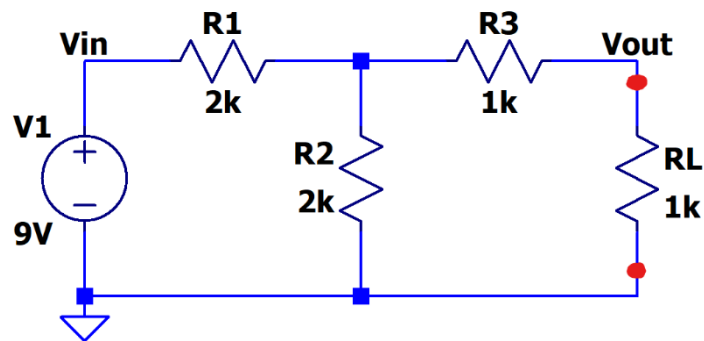
**Quiz 8 – Wednesday, February 16**  
**EE220 – Circuits I**  
**Spring 2022**

Name: \_\_\_\_\_

To get full credit:

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

1. First, determine **Vout** in the circuit below (however you would like). Then, find the Thevenin and Norton equivalent circuits **when RL is removed from the circuit**. Confirm that your Thevenin and Norton equivalent circuits are correct by plugging RL back into your equivalents and verifying that **Vout** in your equivalents matches your original calculation of **Vout**. (5 points)





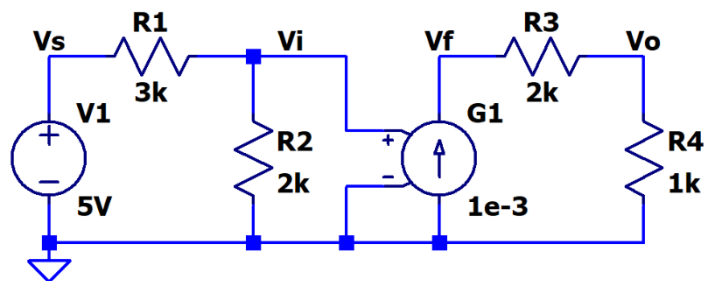
**Quiz 9 – Monday, February 28**  
**EE220 – Circuits I**  
**Spring 2022**

Name: \_\_\_\_\_

To get full credit:

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

1. Determine the voltages ( $V_s$ ,  $V_i$ ,  $V_f$ ,  $V_o$ ) labeled in the circuit given below. Do R2 and R3 dissipate the same amount of power? Show your power calculations to support your answer. (5 points)



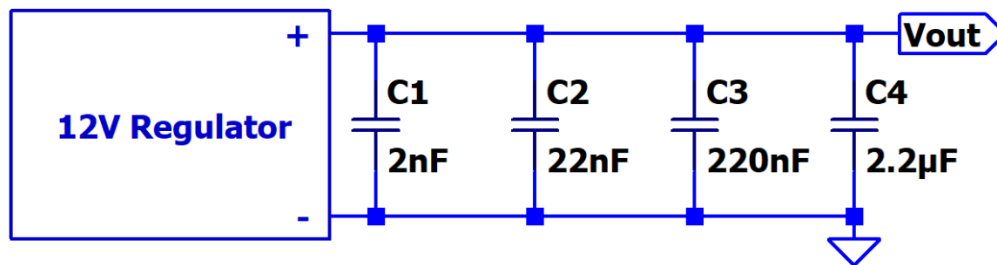
**Quiz 10 – Wednesday, March 23**  
**EE220 – Circuits I**  
**Spring 2022**

Name: \_\_\_\_\_

To get full credit:

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

1. A capacitor bank is designed for the output of a 12V voltage regulator. The capacitor bank consists of a 2nF, 22nF, 220nF, and 2.2 $\mu$ F capacitor connected in parallel. What is the equivalent capacitance of the capacitor bank (in microfarads)? Assuming the output voltage  $V_{out}$  is 12V, how much charge is stored in the capacitor bank? (5 points)



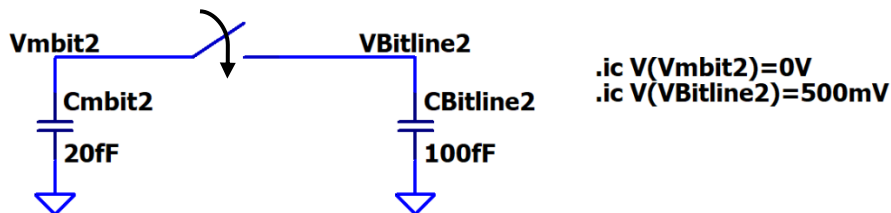
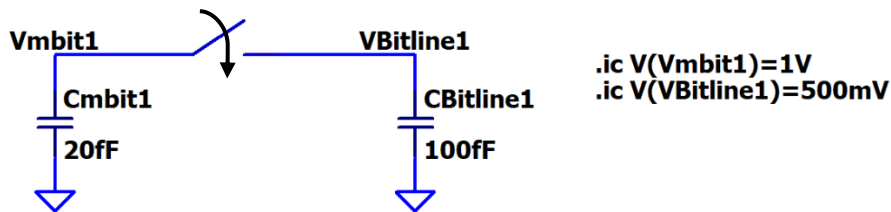
**Quiz 11 – Monday, March 28**  
**EE220 – Circuits I**  
**Spring 2022**

Name: \_\_\_\_\_

To get full credit:

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

1. Note the given initial conditions in the circuits below. The first circuit represents a memory cell storing a “1” (1V), while the second circuit represents a memory cell storing a “0” (0V). The bit line capacitance is initially charged to 0.5V or 500mV while the switch is open. Typical DRAM storage capacitors ( $C_{\text{bit1}}$ ,  $C_{\text{bit2}}$ ) are around 20fF (femtofarads, or  $20 \times 10^{-15}$  F) while typical bit line capacitances ( $C_{\text{Bitline1}}$ ,  $C_{\text{Bitline2}}$ ) are around 100fF, as shown below. Assume that the switches are ideal, and they close at some time  $t = 0$ . After the switches in each circuit close and charge sharing occurs, what is the new voltage across the capacitors in each circuit? (5 points)



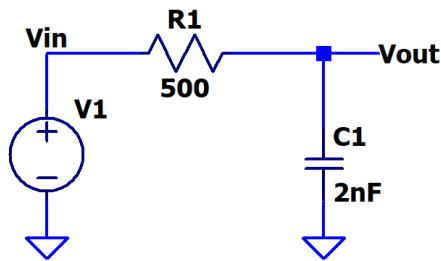
**Quiz 12 – Wednesday, March 30**  
**EE220 – Circuits I**  
**Spring 2022**

Name: \_\_\_\_\_

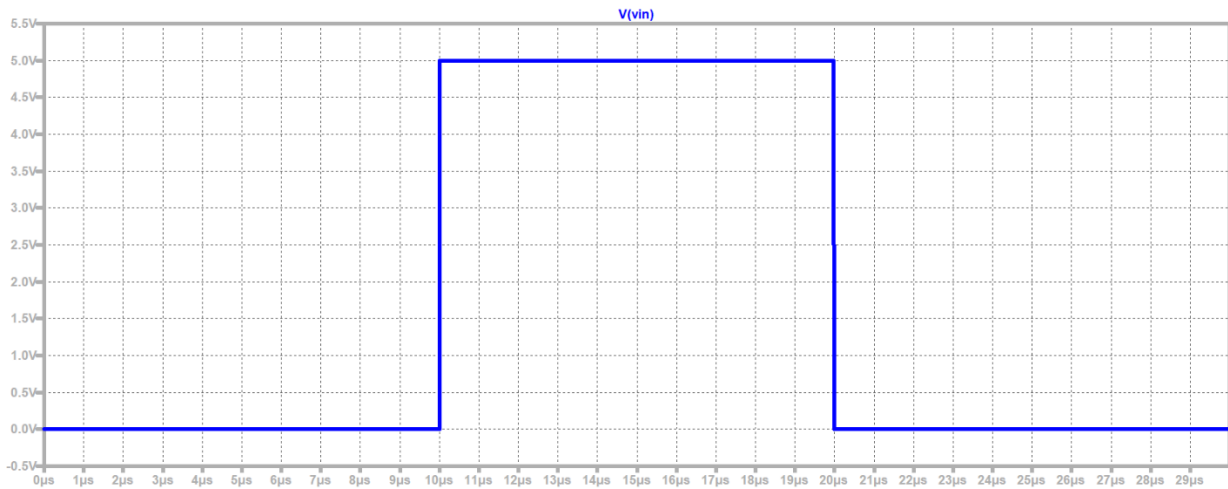
To get full credit:

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

1. Given the RC circuit and the input waveform  $V_{in}(t)$  (plotted below in blue), sketch the waveform for  $V_{out}(t)$  on the given plot. Be sure to plot the following specific data points:  $V_{out}(5\mu s)$ ,  $V_{out}(12\mu s)$ ,  $V_{out}(17\mu s)$ ,  $V_{out}(23\mu s)$ ,  $V_{out}(29\mu s)$ . (5 points)



**PULSE(0 5V 10us 1ps 1ps 10us 20us)**  
**.tran 30us**



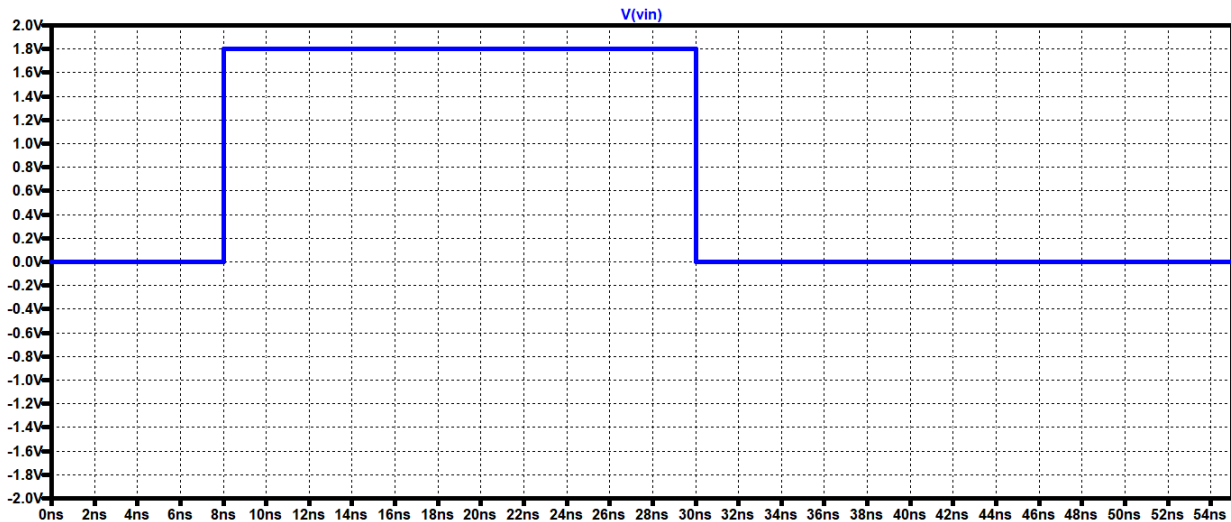
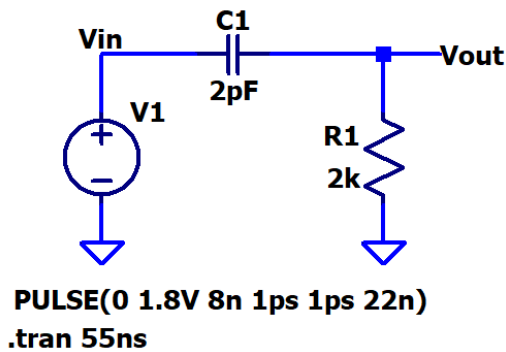
Quiz 13 – Monday, April 4  
EE220 – Circuits I  
Spring 2022

Name: \_\_\_\_\_

To get full credit:

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

1. Given the RC circuit and the input waveform  $V_{in}(t)$  (plotted below in blue), sketch the waveform for  $V_{out}(t)$  on the given plot. **Be sure to plot and label** the following specific data points:  $V_{out}(4ns)$ ,  $V_{out}(12ns)$ ,  $V_{out}(28ns)$ ,  $V_{out}(32ns)$ ,  $V_{out}(50ns)$ . (5 points)



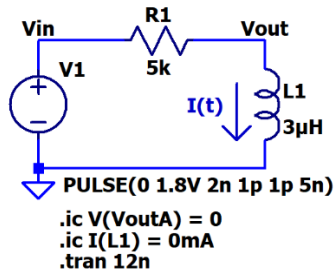
**Quiz 14 – Monday, April 11**  
**EE220 – Circuits I**  
**Spring 2022**

Name: \_\_\_\_\_

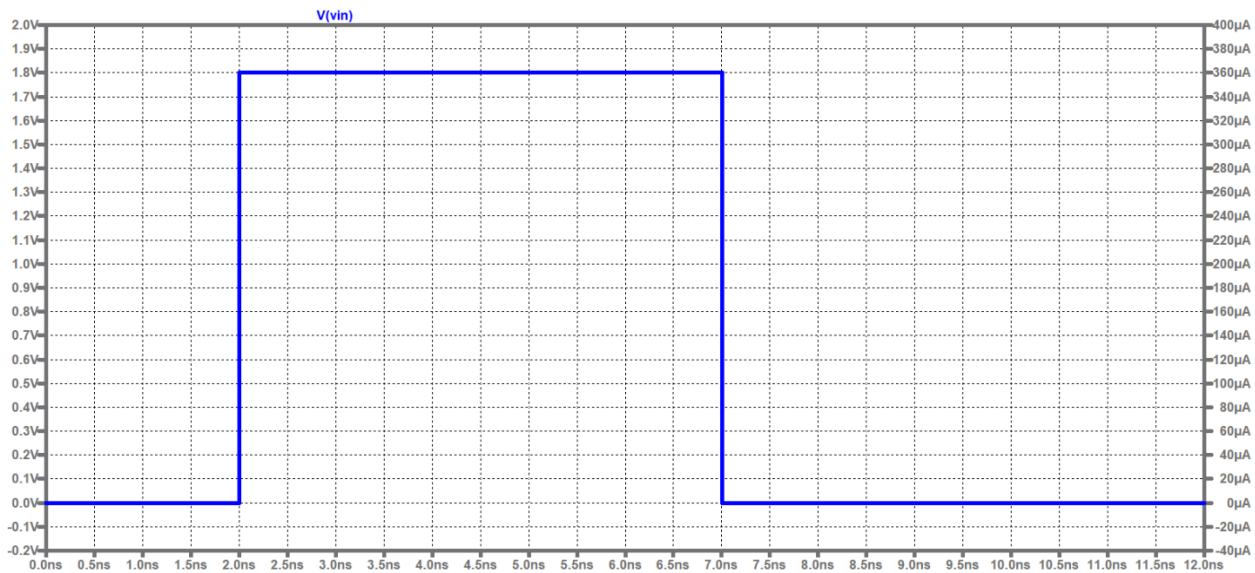
To get full credit:

- Show your work.
- **Write your final answers in the boxes provided.**
- Make sure to **follow all instructions.**

1. Given the RL circuit and the input waveform  $V_{in}(t)$  (plotted below in blue), sketch the waveform for  $I(t)$ . Fill in the table with values for  $I(t)$  at the specified times. Clearly present the equations you came up with for  $I(t)$ , inside the box provided, over the three different time intervals: ( $t < 2\text{ns}$ ,  $2\text{ns} \leq t < 7\text{ns}$ ,  $t \geq 7\text{ns}$ ) . (5 points)



<i>Time (t)</i>	<i>I(t)</i>
1.0 ns	
2.5 ns	
6.0 ns	
8.0 ns	
11.0 ns	



$$I(t) = \begin{cases} & , & t < 2\text{ns} \\ & , & 2\text{ns} \leq t < 7\text{ns} \\ & , & t \geq 7\text{ns} \end{cases}$$

**Quiz 15 – Monday, April 18**  
**EE220 – Circuits I**  
**Spring 2022**

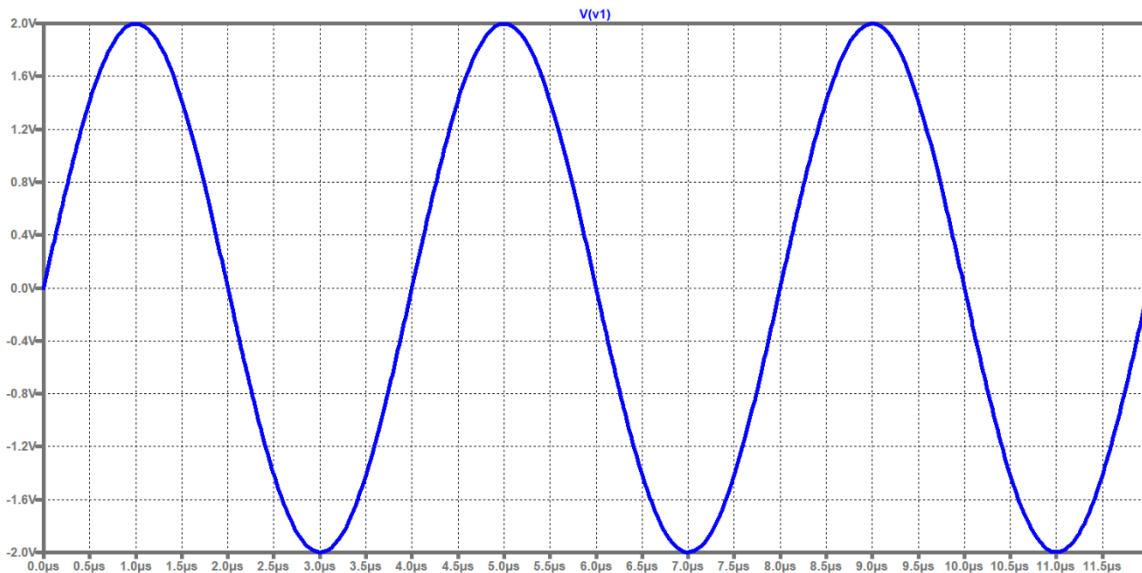
Name: \_\_\_\_\_

To get full credit:

- Show your work.
- **Write your final answers in the box provided.**
- Make sure to **follow all instructions.**

1. Determine the frequency ( $f$ ), amplitude ( $V_A$ ), angular frequency ( $\omega$ ), and period ( $T$ ) of the given sinusoidal waveform  $V_1(t)$  (plotted below in blue). Write your final answers in the box provided. (5 points)

<i>Frequency (<math>f</math>)</i>	
<i>Amplitude (<math>V_A</math>)</i>	
<i>Angular Frequency (<math>\omega</math>)</i>	
<i>Period (<math>T</math>)</i>	



**Quiz 16 – Wednesday, April 27**  
**EE220 – Circuits I**  
**Spring 2022**

Name: \_\_\_\_\_

To get full credit:

- Show your work.
  - **Put a box around your final answers.**
  - Make sure to **follow all instructions.**
1. Determine the phasor representation of **V<sub>in</sub>**, **V<sub>out</sub>**, and **I** in the circuit given below. Note that **V<sub>in</sub>** is a cosine wave with a phase shift of  $0^\circ$  (synonymous with a sine wave with a phase shift of  $90^\circ$ ). You do not need to draw or sketch any of the waveforms. I only want the phasor form of the input, output, and current. (5 points)

