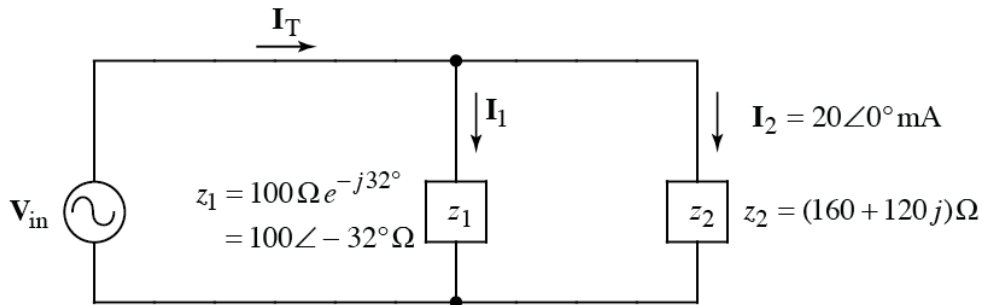1.

a) Find V_{in} in polar form.

b) Find I_T

c) Circle the correct statement (only one is correct):

   i) The source current leads the source voltage

   ii) The source voltage leads the source current

d) What is the numerical value of the phase angle between the voltage and the current?

2. Write a script file that does the following:

   i) Creates an array called D containing the following data pts:

x values:	4	1	9	25
y values:	9	4	16	36

   ii) Plots the data pts as green + signs on an x-y plot.

   iii) Labels the x-axis as "x-axis", the y-axis as "y-axis", and titles the plot "Data".

   iv) Uses polyfit( ) to find a linear fit for the data points in D.

   v) Superimposes a plot of the linear fit on the data plot. The linear fit is to be shown as a red line.

3. Write a script file that makes a 3-D lit surface plot (using meshgrid( )) with interpolated shading of the following function:

$$z = e^{-\alpha t} \cos(3\alpha t) \qquad 0 \le \alpha \le 5 \text{ (11 pts)} \qquad 0 \le t \le 1 \text{ (21 pts)}$$

4. a) Write down a one-line Matlab® command to create the matrix A shown below.

$$A = \begin{bmatrix} 0 & i & 3 \\ i & 0 & 3 \\ 1 & 1 & 3 \end{bmatrix}$$

   b) Given the values in matrix A for part (a), find the value of

   A([1,3], 1)

   c) Given the values in matrix A for part (a), find the value of

   A(A(3, 2))

5. Write the exact code you would enter at the command prompt in Matlab® to compute the following quantity:

$$\ln\left(\left|\sin^2 5 - e^{-3}\right|\right)$$

6. Suppose the following matrix has been defined in Matlab®:

$$C = \begin{bmatrix} 7 & 5 & 6 & 1 \\ 8 & 10 & 7 & 4 \\ 3 & 9 & 10 & 2 \end{bmatrix}$$

a) What is result of the following Matlab® command:

sum(C')

b) What is result of the following Matlab® command:

min(max(C))

7. Write down a one-line Matlab® command to create a horizontal array, called xvec, containing values from 0 to 2 spaced by 0.1. (The last value in the array should equal 2.)

8. Given $t = 0.2 : 0.01 : 0.5$, write down a one-line Matlab® command to compute values of the following function for all values of t using only one command:

$$\left(\frac{t}{1-t}\right)\sin(2\pi t)$$

9. Suppose the following matrices have been defined in Matlab®:

$$A = \begin{bmatrix} 3 & 1 \\ 2 & 5 \end{bmatrix} \qquad B = \begin{bmatrix} 3 & 2 \\ 5 & 5 \end{bmatrix}$$

a) What is result of the following Matlab® command:

A(2,:) ~= B(:,1)'

b) What is result of the following Matlab® command:

find(A < B)

c) What is result of the following Matlab® command:

A(A == B) + 1

10. What is result of the following Matlab® command:

['A = [',num2str(3),'] ',''' Indeed''']