**ENEL101**

**Problem set 2**

**Mathematical operations**

Make sure your name and UCID are correctly filled out.

The questions are based on content from chapter 3 of the textbook “MATLAB, An introduction with applications”.

Note the variable Q will not usually be assigned in your function call; just use the return variable ‘answer =’

Notation in this assignment assumes:

, , , and are row vectors of samples.

Use MATLAB to calculate the following problems.

1. Given a vector of samples , create a vector calculated based on element-by-element operations such that . Construct matrix such that
2. The electric field intensity, , due to a ring of radius at any point along the axis of the ring is given by:

Given R=6 cm and a row vector from elements ranging from 2 cm to 6 cm and spacing of 0.01 cm, use element-by-element operations to calculate a row vector whose elements are . Then construct a matrix of

Hint: use ‘format longg’ to see the significant digits (otherwise you’ll just see 0.0000)

1. The voltage in Volt and the current in Amp seconds after closing the switch in an RC circuit are given by

given and F. Create a row vector , with values of times from 0 to 20 sec with spacing of 2 sec, and use it to create row vectors and such that and . Then construct a matrix of

1. Two vectors are given as

Compute the dot product as .

1. Use cross() to compute the vector cross product as , where is a row vector and and **v** are two row vectors defined in question 4.
2. Use Matlab to show that the reciprocals of [square numbers](http://en.wikipedia.org/wiki/Square_number) produce a convergent series

Do this by computing the following sums

and placing your answers in matrix where

Hint: use abs() to get the absolute value of a number.

1. Given two matrices

and

Determine where the superscript denotes transpose

1. Given two matrices

and

Determine

1. Given matrix

Let be the matrix formed by having each element of *A* inverted such that

Then calculate .

1. The following linear set of equations are determined by applying mesh current analysis to a circuit. Solve the linear set of equations using the \ operator in Matlab

Let be a row vector of the results.