MAT 116E Advanced Scientific and Engineering Computing

Lab-2

Q-1. Given a vector t, of length n, write down the MATLAB expressions that will correctly compute the following.

(n must be read from standart input and create vector t by using rand() command in the interval [-3,5])

a) $\ln(2 + t + t^2)$ b) $e^t(1 + \cos(3t))$ c) $\cos^2 t + \sin^2 t$ d) $\sec^2 t + \cot t - 1$

Q-2. Evaluate the function $y = \frac{x^2\cos(\pi x)}{(x^3+1)(x+2)}$ for x=0 and x=1 using 200 points.

Q-3. Create three row vectors:

v1=[3, -1, 5, 11, -4, 2] v2=[7, -9, 2, 13, 1, -2] v3=[-2, 4, -7, 8, 0, 9]

a) Use three vectors to create a 6x3 matrix in which the columns are the vectors v1, v2 and v3.

b) Find the unit vectors for v1, v2, v3.

$\left(\overrightarrow{v_b} = \frac{\vec{v}}{|\vec{v}|};\ \overrightarrow{v_b} : unit\ vector\right)$

c) Find the angle between vectors v1 and v2.

$(< \vec{u}, \vec{v} > = |\vec{u}||\vec{v}|cos\theta\ ;\theta\ is\ the\ angle\ between\ \vec{u}\ and\ \vec{v})$