Quiz (10) MCS 320 Jan Verschelde Friday 11 April 2003

NAME : ANSWERS

1. In a MATLAB session, type in the following commands:

   $>> u = [1 \;\; 2 \;\; 3]; v = [2 \;\; 3 \;\; -1]; w = [1 \;\; 0 \;\; 1];$

   The volume of the parallelepiped spanned by u, v, and w is the absolute value of the determinant of the 3-by-3 matrix whose columns are u, v, and w.

   Give all MATLAB commands to compute this determinant using the u, v, and w (thus: *without retyping any numbers*). Give also the value you obtained.

   $$>> abs(det([u' \;\; v' \;\; w']))$$

   The volume is 12.

2. Consider the $\sqrt{x}$ for $x \in [0, 2]$. Give all MATLAB commands for the following:

   (a) Take increments of 0.1 to sample the sqrt in the interval $[0, 2]$.
   (b) Take a linear fit of the sqrt using the sample points.
   (c) Make a plot of sqrt and your linear equation on the *same* figure.

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>> x = 0 : 0.1 : 2; y = sqrt(x);  % answer to (a)
>> c = polyfit(x,y,1);            % answer to (b)
>> fp = polyval(c,x);             % sample to plot
>> hold on                        % on same figure
>> plot(x,y)                      % plot of sqrt
>> plot(x,fp)                     % plot fitting polynomial
```

Alternative: On Monday 4/14, give the answers to 1.3.2,3,5 and 2.3.1,3.