

Practice–quiz 4 for Math 2605J1-J2, Fall 2007

Name:

This quiz is to be taken without notes of any sorts. The allowed time is 20 minutes. Provide exact answers; not decimal approximations! For example, if you mean $\sqrt{2}$ do not write 1.414...

I: (3 points) Find the length of the curve

$$\mathbf{x}(t) = \begin{bmatrix} t \\ t^2 \\ \frac{2t^3}{3} \end{bmatrix}, \quad 0 \leq t \leq 2.$$

II: (3 points) Find the solution of the differential equation

$$x' = x^2, \quad x(0) = 1.$$

III: (4 points) Using Householder reflections, find the QR factorization of the matrix

$$\begin{bmatrix} 2 & 2 \\ 1 & 0 \\ 2 & 1 \end{bmatrix}.$$

IV: (3 points) Draw in a qualitative way the vector field given by

$$\mathbf{F}(\mathbf{x}) = \begin{bmatrix} x \\ -y \end{bmatrix}.$$