

Short Exam 4

Name: _____

Physics 403: Mathematical Methods

March 14, 2008

Complete this quiz showing all work.

1. Compute the work done by the force $\vec{F} = -2x\hat{x} - 3y\hat{y}$ when an object is moved from $(x, y) = (0, 0)$ to $(3, 2)$ along a straight line connecting these two points.

2. Compute eigenvalues and eigenvectors of

$$\sigma_1 = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}.$$

3. Solve

$$\frac{dy}{dx} = 1 - \frac{y}{x}$$

subject to $y(x = 1) = 2$.

4. Solve

$$\frac{dy}{dx} - 3y = 2x$$

subject to $y(x = 0) = 1$.