

Short Exam 3

Name: _____

Physics 403: Mathematical Methods

March 3, 2008

Complete this quiz showing all work.

1. Given

$$f(x) = \sum_{k=0}^{\infty} A_k P_k(x)$$

$$A_k = \frac{2k+1}{2} \int_{-1}^1 f(x) P_k(x) dx$$

find A_2 for $f(x) = 7x^2$.

2. Compute the inverse of

$$A = \begin{pmatrix} 3 & 1 & -1 \\ -1 & 1 & 2 \\ -5 & 0 & 1 \end{pmatrix}.$$

3. Let $\vec{F} = 3xy \hat{x}$. Compute the line integral of \vec{F} along the line from $(x, y) = (0, 0)$ to $(x, y) = (1, 2)$.

$$\int_{(0,0)}^{(1,2)} \vec{F} \cdot d\vec{s}$$