Georgia Tech School of Mathematics
Math 1502

Calculus II, Section K

Quiz # 12

December 1st, 2010

First Name : _____

Last Name : _____

Let A denote the 4×4 matrix $A = \begin{bmatrix} \mu & -1 & 0 & 0 \\ -1 & \mu & 1 & 0 \\ 0 & 1 & \mu & -1 \\ 0 & 0 & -1 & \mu \end{bmatrix}$.

1. *(4 pts)* Compute the determinant of A as a function of μ

$\det(A) =$

(Use this page for your calculations)

2. *(2 pts)* Give the values of μ for which A is NOT invertible. *(Hint : the formula* $\left((\sqrt{5}\pm 1)/2\right)^2 = (3\pm\sqrt{5})/2$ *can be used)*

$\mu \ =$

3. *(2 pts)* If D is a diagonal 4×4 matrix with diagonal elements (a, b, c, d) compute DAD^{-1}.

$DAD^{-1} \ =$

4. *(2 pts)* Let $B = \begin{bmatrix} \mu & 1 & 0 & 0 \\ 1 & \mu & 1 & 0 \\ 0 & 1 & \mu & 1 \\ 0 & 0 & 1 & \mu \end{bmatrix}$. Compute $\det(B)$ in terms of $\det(A)$.

(Hint : use the previous question)