Georgia Tech School of Mathematics
Math 1502

Calculus II, Section D

Quiz # 12

December 1st, 2010

First Name : _____

Last Name : _____

All along this quiz A will denote the 4×4 matrix $A = \begin{bmatrix} \lambda & 1 & 0 & 0 \\ 1 & \lambda & 1 & 0 \\ 0 & 1 & \lambda & 1 \\ 0 & 0 & 1 & \lambda \end{bmatrix}$.

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

$$\det(A) =$$

(Use this page for your calculations)

2. *(2 pts)* Give the values of λ 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)*

$\lambda \ =$

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 $B = \begin{bmatrix} \lambda & 1/2 & 0 & 0 \\ 2 & \lambda & 2/3 & 0 \\ 0 & 3/2 & \lambda & 3/4 \\ 0 & 0 & 4/3 & \lambda \end{bmatrix}$. Compute $\det(B)$ in terms of $\det(A)$. *(Hint : use the previous question)*