Math 274
27 July 2017

Quiz 16
Show Appropriate Work

Name: _____
Point Values in boxes.

1. [4] Perform the following multiplication.

$$\begin{bmatrix} 1 & -2 \\ 2 & -3 \end{bmatrix} \begin{bmatrix} -1 & 1 \\ 2 & 1 \end{bmatrix} = \begin{bmatrix} -5 & -1 \\ -8 & -1 \end{bmatrix}$$

2. [4] Yesterday we found an inverse matrix using a variation of the Gauss-Jordan algorithm. We also showed that if $\mathbf{U} = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ is invertible, then $\mathbf{U}^{-1} = \frac{1}{|\mathbf{U}|} \begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$. Using either method, find the inverse of

$$\mathbf{A} = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}.$$

$|A| = 4 - 6 = -2$

so

$$A^{-1} = \frac{1}{-2} \begin{bmatrix} 4 & -2 \\ -3 & 1 \end{bmatrix}$$

3. [2] Let $\mathbf{X}(t) = \begin{bmatrix} e^{2t} & 3e^{-t} \\ 3e^{2t} & -2e^{-t} \end{bmatrix}$, find $\mathbf{X}'(t)$.

$$X'(t) = \begin{bmatrix} 2e^{2t} & -3e^{-t} \\ 6e^{2t} & 2e^{-t} \end{bmatrix}$$