Math 322 - Matrix Algebra SOLUTIONS
Friday, October 9 ** *Quiz 5* Name: _____

1. (**4 points**) Use the method of **cofactor expansion** to find the determinant of

$$A = \begin{pmatrix} 1 & 0 & 0 & 1 \\ 10 & 11 & 7 & -3 \\ -5 & -2 & 0 & 8 \\ 2 & 0 & 0 & 4 \end{pmatrix}$$

$$\det(A) = 0 - 7\begin{vmatrix} 1 & 0 & 1 \\ -5 & -2 & 8 \\ 2 & 0 & 4 \end{vmatrix} + 0 - 0 = (-7)\cdot(-2)\begin{vmatrix} 1 & 1 \\ 2 & 4 \end{vmatrix} = 14(4-2) = 28$$

$$\boxed{\det(A) = 28}$$

2. (**2 points**) True/False. No justification required.

   If $\det(A) = 5$, then A is invertible. (T) / F

   An $n \times n$ is invertible if and only if the determinant is not equal to 0.

3. (**4 points**) Suppose that A and B are 4×4 matrices, with $\det(A) = 2$ and $\det(B) = -3$. Find the determinants of the following matrices.

   (a) $\det(AB) = 2 \cdot (-3) = -6$

   (b) $\det(-A) = (-1)^4 \cdot 2 = 2$

   (c) $\det(2B) = (2)^4 \cdot (-3) = -48$

   (d) $\det(B^{-1}) = 1/(-3) = -\frac{1}{3}$