

MATH 54 – QUIZ 3

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Name: _____

Instructions: You have 15 minutes to take this quiz, for a total of 10 points. May your luck be invertible!

1. (4 points) Find the inverse of the following matrix (or say it's not invertible)

$$\begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 3 & 2 & -1 \\ -1 & 1 & 0 & 0 \\ -1 & 1 & 1 & 0 \end{bmatrix}$$

2. (2 points) Recall that a matrix A is symmetric if $A^T = A$. Show that $AB + B^T A^T$ is always symmetric (even if A and B are not necessarily symmetric).

Date: Thursday, February 12, 2015.

3. (4 points) Find the determinant of the following matrix, where x, y, z, t are distinct real numbers. Write your answer in factored form.

$$A = \begin{bmatrix} 1 & x & x^2 & x^3 \\ 1 & y & y^2 & y^3 \\ 1 & z & z^2 & z^3 \\ 1 & t & t^2 & t^3 \end{bmatrix}$$

Hint: You might find the formula $p^3 - q^3 = (p - q)(p^2 + pq + q^2)$ (where p and q are real numbers) useful!