

## MATH 54 – QUIZ 11

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Name: \_\_\_\_\_

**Instructions:** You have 20 minutes to take this quiz, for a total of 10 points. May your luck be symmetric!

1. (5 points) Find a diagonal matrix  $D$  and an **orthogonal** matrix  $P$  such that  $A = PDP^T$ , where:

$$A = \begin{bmatrix} 3 & -2 & 4 \\ -2 & 6 & 2 \\ 4 & 2 & 3 \end{bmatrix}$$

**Note:** The eigenvalues of  $A$  are  $\lambda = -2$  and  $\lambda = 7$ . You may also assume that a basis for  $E_{-2}$  is  $\left\{ \begin{bmatrix} 2 \\ 1 \\ -2 \end{bmatrix} \right\}$ .

(TURN PAGE; continue on the back if needed)

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Date: Friday, November 14, 2014.

2. (5 points) Solve the following differential equation:

$$\begin{cases} y'' - 2y' + 5y = 0 \\ y(0) = 2 \\ y'(0) = 8 \end{cases}$$