

MATH 54 SPRING 2019: DISCUSSION 109/112 QUIZ#5

GSI: CHRISTOPHER EUR, DATE: 3/12/2019

STUDENT NAME: _____

Problem 1. Define $T : \mathbb{P}_3 \rightarrow \mathbb{R}^4$ given by $T(p(x)) = \begin{bmatrix} p(-3) \\ p(-1) \\ p(1) \\ p(3) \end{bmatrix}$. Let $B = \{1, x, x^2, x^3\}$ and $E = \{e_1, e_2, e_3, e_4\}$ be bases for \mathbb{P}_3 and \mathbb{R}^4 (respectively). Find the matrix of transformation ${}_E[T]_B$.

Problem 2. True/false: if true, give a justification; if false, give a counterexample.

- (1) If A is diagonalizable $n \times n$ matrix, then A has n distinct eigenvalues.
- (2) If A is invertible, then A is diagonalizable.