MATH 54 FALL 2017: DISCUSSION 205/208 QUIZ#8

GSI: CHRISTOPHER EUR, DATE: 10/20/2017

STUDENT NAME: _____

Problem 1. (2 points each) If true, prove the statement. If false, give a counterexample.
(a): Every 2×2 matrix A with $\det A = 3$ is diagonalizable.
(b): Let $T : V \to V$ be a linear map. If $u, v \in V$ are eigenvectors of T, then so is $u + v$.

Problem 2. (6 points) Consider a linear map $T : \mathbb{P}_2 \to \mathbb{P}_2$ given by $p(t) \mapsto ((t+1)p(t))'$. Find a basis B of $\mathbb{P}_2$ such that the matrix of the linear transformation ${}_B[T]_B$ is diagonal.