MATH 54 – DISC 216 QUIZ 4 SEPTEMBER 19, 2019

Please show **all** your work and circle your answer! Please read the questions carefully. You can use the back of this quiz to write answers, but clearly indicate which problem you are solving. You have 15 minutes for this quiz.

Name:_____

1. (3pts) Let $T : \mathbb{R}^2 \to \mathbb{R}^2$ be a linear transformation that maps $(4, 1)$ to $(11, 3)$ and maps $(-1, -1)$ to $(-2, 4)$. Determine $T((-1, 1))$

2. (2pts) Let $T : \mathbb{R}^2 \to \mathbb{R}^2$ be the linear transformation that rotates points $-\pi/4$ radians about the origin (clockwise). Determine the standard matrix[1] for T, call it M. [*Hint:* $T(\mathbf{e}_1) = (1/\sqrt{2}, -1/\sqrt{2})$]

3. (2pts) Compute M^2 from problem (2) **and** describe what the linear map (that corresponds to this new matrix) does to points on $\mathbb{R}^2$

[1] That is $T(\vec{x}) = A\vec{x}$ for all $\vec{x} \in \mathbb{R}^2$