Quiz #8

Directions: Carefully read each question below and answer to the best of your ability in the space provided. Your answer to problems should be written in a clear and concise manner.
You **MUST** show your work to receive full credit!

1. (5 points) Find the images of $\vec{u} = \begin{bmatrix} 5 \\ -2 \end{bmatrix}$ and $\vec{v} = \begin{bmatrix} 1 \\ 3 \end{bmatrix}$ under the linear transformation $T : \mathbb{R}^2 \to \mathbb{R}^2$, defined by $T(\vec{x}) = A\vec{x}$ with $A = \begin{bmatrix} 2 & 1 \\ 3 & -2 \end{bmatrix}$.

2. (5 points) For the following linear transformations find the corresponding 2×2 matrix.

    1. Dilation by a factor of 3
    2. Rotation by 45-degrees clockwise
    3. Identity matrix
    4. Rotation by 60-degrees counterclockwise
    5. Projection onto the x-axis

Hint: Recall that a general form of the rotation matrix R_α is

$$R_\alpha = \begin{bmatrix} \cos(\alpha) & -\sin(\alpha) \\ \sin(\alpha) & \cos(\alpha) \end{bmatrix}$$

where $\alpha > 0$ would correspond to the rotation counterclockwise.

Name: _____

Section (circle one): 001 002

Question:	1	2	Total
Points:	5	5	10
Score:			