For each transformation T, find the corresponding matrix A. Is T one-one? onto?

1. $T : \mathbb{R}^2 \to \mathbb{R}^2$ stretches vertically away from the x-axis by a factor of 2
2. $T : \mathbb{R}^2 \to \mathbb{R}^2$ rotates by $\frac{\pi}{3}$ counter-clockwise and then reflects across the x-axis
3. $T : \mathbb{R}^2 \to \mathbb{R}^2$ rotates by $\frac{\pi}{4}$ clockwise and then stretches horizontally away from the y-axis by a factor of 3
4. $T : \mathbb{R}^3 \to \mathbb{R}^3$ projects onto the yz-plane
5. $T : \mathbb{R}^3 \to \mathbb{R}^3$ rotates clockwise by $\frac{\pi}{2}$ about the x-axis
6. $T : \mathbb{R}^2 \to \mathbb{R}^3$ embeds $\mathbb{R}^2$ into the xy-plane in $\mathbb{R}^3$