

Name: _____ Date: _____

Show your work very clearly, neatly, and box your final answer.**One Side Only**

1. Find $P, P^{-1}, A,$ and A' for $T : \mathbb{R}^2 \rightarrow \mathbb{R}^2, T(x, y) = (2x + y, x - 2y)$ with $B = \{(1, 0), (0, 1)\}$ & $B' = \{(1, 2), (0, 4)\}$.

2. Find $P, P^{-1}, A,$ and A' for

$$T : \mathbb{R}^3 \rightarrow \mathbb{R}^3, T(x, y, z) = (x, x + 2y, x + y + 3z) \text{ with}$$

$$B = \{(1, 0, 0), (0, 1, 0), (0, 0, 1)\} \text{ & } B' = \{(1, -1, 0), (0, 0, 1), (0, 1, -1)\}.$$

3. Let A and B are similar matrices, then Prove that if A is a nonsingular, then B is also nonsingular, and A^{-1} and B^{-1} are similar.

4. Prove that if A and B are similar matrices, then $|A| = |B|$.