1) Write the matrix of the linear transformation with respect to the standard base.

$T : R \rightarrow R^2$
$T(x) = (x, 3x)$

2) Write the matrix of the linear transformation with respect to the given base.

$T : R^2 \rightarrow R^2$
$T(x, y) = (x + y, x - y)$
Base vectors $\{ (1, 1), (1, 0) \}$ in R^2

3) $T : R^3 \rightarrow R^3$ linear transformation matrix with respect to the standard base is given below.

$$\begin{pmatrix} 1 & 2 & 0 \\ 2 & 3 & 1 \\ -1 & 1 & 0 \end{pmatrix}$$

Which one is $T(x, y, z)$?

A. (x, y, z) B. $(x + y, 2x - 1, -1 + x - y)$
C. $(x + 2y, 2x +3y + z, - x + y)$ D. $(x + 2x - y, 2x + 3y + z, y)$
E. $(x, x + 3y + 2z, -x + 2y - 5z)$

4) $E = \{ (1, 1, 1), (1, 1, 0), (1, 0, 0) \}$, $E' = \{ (1, 0, 0), (0, -1, 1), (-1, 0, 1) \}$ standart bases in R^3 are given. Find the base transformation matrix from E to E'.

5) $T, S : R^2 \rightarrow R^2$
$T(x, y) = (x + y , x)$
$S(x, y) = (y , x + y)$
What is $(S \circ T)(x, y)$?