Refer to the linear operator T: R3 -> R3 defined by T (x1, x2, x3) = (x1 – 3x3, x1 + 2x2 + x3, x3 – 3x1).

Determine whether or not there is a basis F for R3 relative to which the transformation T can be represented by a diagonal matrix

 D = [T]F.

If there is, show that D is similar to the standard matrix representation [T]E for T.

If not, why?

(Note that I’ve already found eigenvalues of 2, 4 and -2.)