MA2071 Linear Algebra
C Term, Sections C01-C04
W. J. Martin
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PRACTICE ONLY – DO NOT HAND IN

20 minutes

Linear Algebra Quiz 3

For each of the following functions from $\mathbb{R}^3$ to $\mathbb{R}^2$, decide whether or not T is a linear transformation. If you conclude that T *is* a linear transformation, then give the images of $\mathbf{e}_1 = (1, 0, 0)$, $\mathbf{e}_2 = (0, 1, 0)$ and $\mathbf{e}_3 = (0, 0, 1)$, under T. If you conclude that T is *not* a linear transformation, then give **explicit values** where the function fails to satisfy the definition of a linear transformation.

1.) $T(x, y, z) = (2x + y,\ 0)$

2.) $T(x, y, z) = (y - 10z,\ \sin x)$

3.) $T(x, y, z) = (yz,\ 0)$

4.) $T(x, y, z) = (4x - 3y + z, x + 9z)$