Linear Algebra
C Term, Sections C01-C04
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January 25, 2002

PRACTICE ONLY – DO NOT HAND IN

Linear Algebra Quiz 3

For each of the following functions T, determine whether or not T is a linear transformation. In addition to an asnwer of "YES" or "NO", give sound reasons for your answer.

(a) $T : R^3 \to R^2$ via

$$T\left(\begin{bmatrix} u_1 \\ u_2 \\ u_3 \end{bmatrix}\right) = \begin{bmatrix} u_1 - 2u_2 \\ u_1 + u_3 - 4 \end{bmatrix}$$

(b) $T : R^2 \to R^2$ via

$$T\left(\begin{bmatrix} u_1 \\ u_2 \end{bmatrix}\right) = \begin{bmatrix} u_1 - 2u_2 \\ u_1 + 2u_2 \end{bmatrix}$$

(c) $T : R^2 \to R^3$ via

$$T\left(\begin{bmatrix} u_1 \\ u_2 \end{bmatrix}\right) = \begin{bmatrix} u_1 - 2u_2 \\ u_2^2 \\ u_1 + 4u_3 + u_3 \end{bmatrix}$$