

Math 220 Assignment

November 19, 2001

Due Wednesday, November 21

1. Find the matrices for change of basis in both directions between the standard basis of \mathbf{R}^3 and the basis formed by the columns of the matrix

$$\begin{pmatrix} 3 & 2 & 4 \\ 2 & -3 & 1 \\ 3 & -6 & 1 \end{pmatrix} .$$

2. Let f be the linear function from \mathbf{R}^3 to \mathbf{R}^3 given by $f(x) = Mx$ where

$$M = \begin{pmatrix} 1 & 5 & -2 \\ -2 & 4 & -3 \\ -1 & -3 & 1 \end{pmatrix} .$$

Find the matrix of f relative to the basis of \mathbf{R}^3 given by the columns of the matrix in the preceding exercise.

3. Let σ denote reflection in the plane $x + y + z = 0$ (a linear function from \mathbf{R}^3 to \mathbf{R}^3). Find the standard matrix of σ , i.e., the matrix of σ relative to the standard basis of \mathbf{R}^3 .

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