

ADDITIONAL HOMEWORK PROBLEMS

MATH 22

For each of the following two problems find a basis for the Range of T . Compute their dimensions and determine whether T is one-to-one and onto.

(1) $T : M_{2 \times 3} \rightarrow M_{2 \times 2}$ defined by

$$T \begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \end{bmatrix} = \begin{bmatrix} 2a_{11} - a_{12} & a_{13} + 2a_{12} \\ 0 & 0 \end{bmatrix}.$$

(2) $T : P_2 \rightarrow P_3$ defined by $T(p(t)) = tp(t) + p'(t)$.