

You have 20 minutes to complete this quiz. To receive full credit, you must justify your answers.

Name : _____

1. (5 points) Find all values of c so that the following matrix has linearly independent columns.

$$\begin{bmatrix} 4 & 7 & c \\ 2 & 4 & 2 \\ 0 & 7 & 3 \end{bmatrix}$$

2. (5 points) Let $T : \mathbb{R}^3 \rightarrow \mathbb{R}^2$ be the linear transformation given by

$$T \left(\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} \right) = \begin{bmatrix} x_1 - x_2 + x_3 \\ x_1 + x_2 - x_3 \end{bmatrix}.$$

Is T onto?