Name: ....

Determine whether the following sets of vectors in $\mathbb{R}^3$ are linearly independent. Justify each answer.

(a) $\begin{bmatrix} 1 \\ 4 \\ -7 \end{bmatrix}, \begin{bmatrix} -2 \\ 5 \\ 3 \end{bmatrix}, \begin{bmatrix} 0 \\ 1 \\ -1 \end{bmatrix}, \begin{bmatrix} 2 \\ -3 \\ -1 \end{bmatrix}$

(b) $\begin{bmatrix} -6 \\ 2 \\ -1 \end{bmatrix}, \begin{bmatrix} 3 \\ -1 \\ \frac{1}{2} \end{bmatrix}$

(c) $\begin{bmatrix} 245 \\ 0 \\ -405 \end{bmatrix}, \begin{bmatrix} -13 \\ -17 \\ -19 \end{bmatrix}$

(d) $\begin{bmatrix} 0 \\ 0 \\ -4 \end{bmatrix}$

(e) $\begin{bmatrix} 5 \\ -3 \\ -1 \end{bmatrix}, \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}, \begin{bmatrix} -7 \\ 2 \\ 4 \end{bmatrix}$