Name _____

1) Find the determinant of the matrix below.

$$\begin{bmatrix} 3 & 2 & 0 & 0 \\ 1 & 0 & 3 & 0 \\ -1 & 4 & 0 & 8 \\ 0 & -1 & 2 & 0 \end{bmatrix}$$

$$\begin{vmatrix} 3 & 2 & 0 & 0 \\ 1 & 0 & 3 & 0 \\ -1 & 4 & 0 & 8 \\ 0 & -1 & 2 & 0 \end{vmatrix} = 3\begin{vmatrix} 0 & 3 & 0 \\ 4 & 0 & 8 \\ -1 & 2 & 0 \end{vmatrix} - 2\begin{vmatrix} 1 & 3 & 0 \\ -1 & 0 & 8 \\ 0 & 2 & 0 \end{vmatrix} = -3 \cdot 8 \cdot \begin{vmatrix} 0 & 3 \\ -1 & 2 \end{vmatrix} + 2 \cdot 8 \begin{vmatrix} 1 & 3 \\ 0 & 2 \end{vmatrix}$$

$$= -24(3) + 16(2) = -72 + 32 = -40$$

2) Given the information below, write down a formula for $[\vec{x}]_{B_2}$. You do not need to compute or simplify your answer.

$$B_1 = \left\{\begin{bmatrix}1\\2\\3\end{bmatrix}, \begin{bmatrix}1\\1\\1\end{bmatrix}, \begin{bmatrix}1\\0\\7\end{bmatrix}\right\} \quad B_2 = \left\{\begin{bmatrix}1\\0\\3\end{bmatrix}, \begin{bmatrix}-1\\1\\-1\end{bmatrix}, \begin{bmatrix}5\\5\\0\end{bmatrix}\right\} \quad \vec{x} = \begin{bmatrix}1\\5\\4\end{bmatrix}_{B_1}$$

$$[\vec{x}]_{B_2} = \begin{bmatrix}1 & -1 & 5\\0 & 1 & 5\\3 & -1 & 0\end{bmatrix}^{-1} \begin{bmatrix}1 & 1 & 1\\2 & 1 & 0\\3 & 1 & 7\end{bmatrix} \begin{bmatrix}1\\5\\4\end{bmatrix}_{B_1}$$