Solution (#810)

$$T(X\mathbf{v}_1 + Y\mathbf{v}_2) = X\mathbf{v}_1 + Y\left(\mathbf{v}_2 + \frac{10}{7}\mathbf{v}_1\right) = \left(X + \frac{10Y}{7}\right)\mathbf{v}_1 + Y\mathbf{v}_2,$$

and the matrix for T with respect to $\mathbf{v}_1$ and $\mathbf{v}_2$ is

$$\begin{pmatrix} 1 & 10/7 \\ 0 & 1 \end{pmatrix}.$$