1.
$$\vec{u}_1 \cdot \vec{u}_2 = -2+1+1=0$$
$$\vec{u}_1 \cdot \vec{u}_2 = 0-1+1=0$$
$$\vec{u}_2 \cdot \vec{u}_3 = 0-1+1=0$$

$$\text{comp}_{\vec{u}_1}\left(\vec{v}\right)=\frac{\vec{v}\cdot\vec{u}_1}{\vec{u}_1\cdot\vec{u}_1}=\frac{2}{3},\quad \text{comp}_{\vec{u}_2}\left(\vec{v}\right)=\frac{\vec{v}\cdot\vec{u}_2}{\vec{u}_2\cdot\vec{u}_2}=\frac{-4}{6}=-\frac{2}{3},\quad \text{comp}_{\vec{u}_3}\left(\vec{v}\right)=\frac{\vec{v}\cdot\vec{u}_3}{\vec{u}_3\cdot\vec{u}_3}=\frac{-2}{2}=-1$$

Check: $\left(\frac{2}{3}\right)\begin{bmatrix}1\\1\\1\end{bmatrix}+\left(-\frac{2}{3}\right)\begin{bmatrix}-2\\1\\1\end{bmatrix}+\left(-1\right)\begin{bmatrix}0\\-1\\1\end{bmatrix}=\begin{bmatrix}2\\1\\-1\end{bmatrix}=\vec{v}$

2. $\vec{w}_1=\begin{bmatrix}1\\1\\1\\1\end{bmatrix},\quad \vec{w}_2=\vec{v}_2-\frac{\vec{v}_2\cdot\vec{w}_1}{\vec{w}_1\cdot\vec{w}_1}\vec{w}_1=\begin{bmatrix}-1\\1\\1\\0\end{bmatrix}-\left(\frac{1}{4}\right)\begin{bmatrix}1\\1\\1\\1\end{bmatrix}=\begin{bmatrix}-5/4\\3/4\\3/4\\-1/4\end{bmatrix}$. Rename $\vec{w}_2=\begin{bmatrix}-5\\3\\3\\-1\end{bmatrix}$.

$$\vec{w}_3=\vec{v}_3-\frac{\vec{v}_3\cdot\vec{w}_1}{\vec{w}_1\cdot\vec{w}_1}\vec{w}_1-\frac{\vec{v}_3\cdot\vec{w}_2}{\vec{w}_2\cdot\vec{w}_2}\vec{w}_2=\begin{bmatrix}-1\\0\\1\\2\end{bmatrix}-\left(\frac{2}{4}\right)\begin{bmatrix}1\\1\\1\\1\end{bmatrix}-\left(\frac{6}{44}\right)\begin{bmatrix}-5\\3\\3\\-1\end{bmatrix}=\begin{bmatrix}-9/11\\-10/11\\1/11\\18/11\end{bmatrix}$$. Rename $\vec{w}_3=\begin{bmatrix}-9\\-10\\1\\18\end{bmatrix}$

Our orthonormal basis is $\left\{\frac{1}{2}\begin{bmatrix}1\\1\\1\\1\end{bmatrix},\ \frac{1}{\sqrt{44}}\begin{bmatrix}-5\\3\\3\\-1\end{bmatrix},\ \frac{1}{\sqrt{506}}\begin{bmatrix}-9\\-10\\1\\18\end{bmatrix}\right\}$. Call the vectors in this set, respectively, $\hat{w}_1$, $\hat{w}_2$, and $\hat{w}_3$. Then:

$$\text{comp}_{\hat{w}_1}\left(\vec{v}\right)=\vec{v}\cdot\hat{w}_1=13,\quad \text{comp}_{\hat{w}_2}\left(\vec{v}\right)=\vec{v}\cdot\hat{w}_2=\frac{14}{\sqrt{44}},\quad \text{comp}_{\hat{w}_3}\left(\vec{v}\right)=\vec{v}\cdot\hat{w}_3=\frac{276}{\sqrt{506}}$$

Check: $(13)\left(\frac{1}{2}\right)\begin{bmatrix}1\\1\\1\\1\end{bmatrix}+\left(\frac{14}{\sqrt{44}}\right)\left(\frac{1}{\sqrt{44}}\right)\begin{bmatrix}-5\\3\\3\\-1\end{bmatrix}+\left(\frac{276}{\sqrt{506}}\right)\left(\frac{1}{\sqrt{506}}\right)\begin{bmatrix}-9\\-10\\1\\18\end{bmatrix}=\begin{bmatrix}0\\2\\8\\16\end{bmatrix}=\vec{v}$