Problems from Assignment 19

1. In the proof from class we had to construct a orthogonal matrix starting with the top row being $\vec{p}$. Do this for one particular example. Let

$$\vec{p} = \begin{bmatrix} \sqrt{\frac{1}{3}} \\ \sqrt{\frac{1}{3}} \\ \sqrt{\frac{1}{3}} \end{bmatrix}.$$

Find $\vec{v}_1, \vec{v}_2$ so that:

$$A = \begin{bmatrix} \vec{p}^T \\ \vec{v}_1^T \\ \vec{v}_2^T \end{bmatrix}.$$

is orthogonal.