Section 6.3

Let $y = \begin{pmatrix} 10 \\ 4 \\ 8 \end{pmatrix}$ and let W be the span of $\begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix}$ and $\begin{pmatrix} 3 \\ 4 \\ 1 \end{pmatrix}$.

1. Find the vector in W that is closest to y.

2. Write y as the sum of a vector in W and a vector orthogonal to W.