Worksheet 7

Name: _____   Score: _____

1 New Stuff §6.2-6.5

1. Suppose W is the subspace of $\mathbb{R}^n$ spanned by the given vectors. Find a basis for $W^\perp$. Recall $(\operatorname{Col} A)^\perp = \operatorname{Nul}(A^T)$.

   - $$\begin{bmatrix} 1 \\ 1 \\ 4 \\ 1 \end{bmatrix} \begin{bmatrix} 1 \\ 0 \\ 1 \\ -1 \end{bmatrix}$$

   - $$\begin{bmatrix} 1 \\ 0 \\ 1 \\ -1 \end{bmatrix} \begin{bmatrix} -3 \\ 1 \\ 0 \\ 5 \end{bmatrix}$$

2. Apply Gram-Schmidt to the columns and rescale if necessary to get an *orthonormal* matrix P, i.e., $P^T P = I$. You may need a calculator for the 3x3 case.

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

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

   - $$\begin{bmatrix} 1 & 1 \\ 2 & 1 \end{bmatrix}$$

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