Name:

1. Let V be the inner product space consisting of the vector space $\mathbb{R}^3$ with inner product given by

$$(u_1, u_2, u_3) \cdot (v_1, v_2, v_3) = u_1v_1 + 2u_2v_2 + 3u_3v_3.$$

Use the Gram-Schmidt process to find an orthonormal basis for the subspace of V spanned by the vectors $(1, 0, 1)$ and $(1, 2, -1)$.

2. Find the equation of the line which best fits the following points in the least-squares sense:

$$(1, -2),\ (-1, 2),\ (0, 1)$$