
Q3

The distance between the vector A and the vector subspace L will be maximal when the orthogonality condition is satisfied.

$$A = (1,1,1), L_1 = (1,0,-1) \therefore A \cdot L_1 = (1,1,1) \cdot (1,0,-1) = 1 + 0 + -1 = 0 \implies$$
$$A = (1,1,1), L_2 = (3,5,x) \therefore A \cdot L_2 = (1,1,1) \cdot (3,5,x) = 3 + 5 + x = 0 \implies x$$

The squared distance can be derived from formula =
$|x| = \sqrt{\langle x, x \rangle} \implies \sqrt{1+1+1} = \sqrt{3}$