Linear algebra exercise 03162017

1. (15 points)Let **w** be a vector in $\mathbf{R}^n$ Let W be the set of vectors that are orthogonal to **w**. Show that W is a subspace of $\mathbf{R}^n$.

2. (15 points) Find a basis for the subspace W of vectors in that are orthogonal to **w** = (1, 3, 1). Give the dimension and a geometrical description of W.

3. (30 points) State and prove the Cauchy-Schwartz inequality

4. (15 points) State and prove triangle inequality

5. (15 points) State and prove pythagorean theorem