If you haven't already done so, collect the handout "Sets: Notation and Terminology" from the handouts page. Note the meaning and notation for: intersection of two sets, union of two sets.

1. Prove that the intersection of two subspaces of a given vector space V is also a subspace of V. In other words, prove that if W and $\tilde{W}$ are vector subspaces of the same vector space V, then $W \bigcap \tilde{W}$ is also a subspace of V.

2. Must the union of two subspaces of a given vector space V always be a subspace? If so, prove. If not, give an example to illustrate.