Exercise 5.3
Valence Bond Theory vs. Molecular Orbital Theory

1. What is the most significant difference between the valence bond approach to bonding and the molecular orbital approach to bonding?

2. In MO theory, molecular orbitals are formed by combining atomic orbitals.
   In VB theory, hybrid orbitals are formed by combining atomic orbitals.
   Briefly, explain how the formation of hybrid orbitals is **<u>different</u>** from the formation of molecular orbitals.

3. For each type of hybrid orbital listed, list the atomic orbitals involved in its formation **<u>and</u>** indicate how many hybrid orbitals of that type are formed from that set of atomic orbitals. *Be specific. For p orbitals, indicate whether p_x, p_y or p_z is involved.*

(a) sp (b) sp^2 (c) sp^3