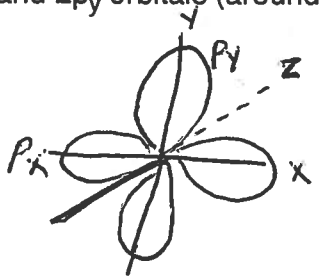
MAD ORG. CHEM. MIN. #1

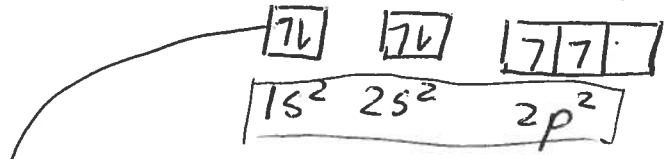
LAST NAME_____ FIRST NAME_____

IO#_____ SECTION #_____

1. Sketch the $2p_x$ and $2p_y$ orbitals (around the same nucleus, please).



2. a. Write the electron configuration of carbon. C - at # = 6



b. Are the p electrons in the same orbital? Why or why not?

→ No - Hund's Rule → half fill degenerate orbitals before pairing
- lower energy (less repulsion) when unpaired e- occupy diff. orbitals

3. What element is represented by the following ground state electron configuration?

Key words!

$1s^2 2s^2 2p^6 3s^2 3p^6 3d^2$ ← 20 e⁻

Ca has 20 e⁻
Ti has 22 e⁻

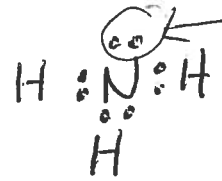
None! - if Ca, would be $4s^2$ NOT $3d^2$
- Ti^{2+} is NOT ground state

4. Answer the following questions about NH_3 (ammonia):

a. What type of bond is formed between the hydrogen and nitrogen atoms in a unit of ammonia? covalent or polar covalent

b. Draw a Lewis structure for ammonia.

Must show



c. What shape is the smallest unit of ammonia? (Name the shape and draw a structure.)

trigonal pyramid

N is tetrahedral, but we don't consider lone pairs when determining shape

arrangement of the e⁻ pairs