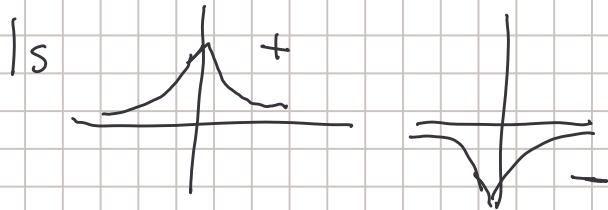


# Ch 2

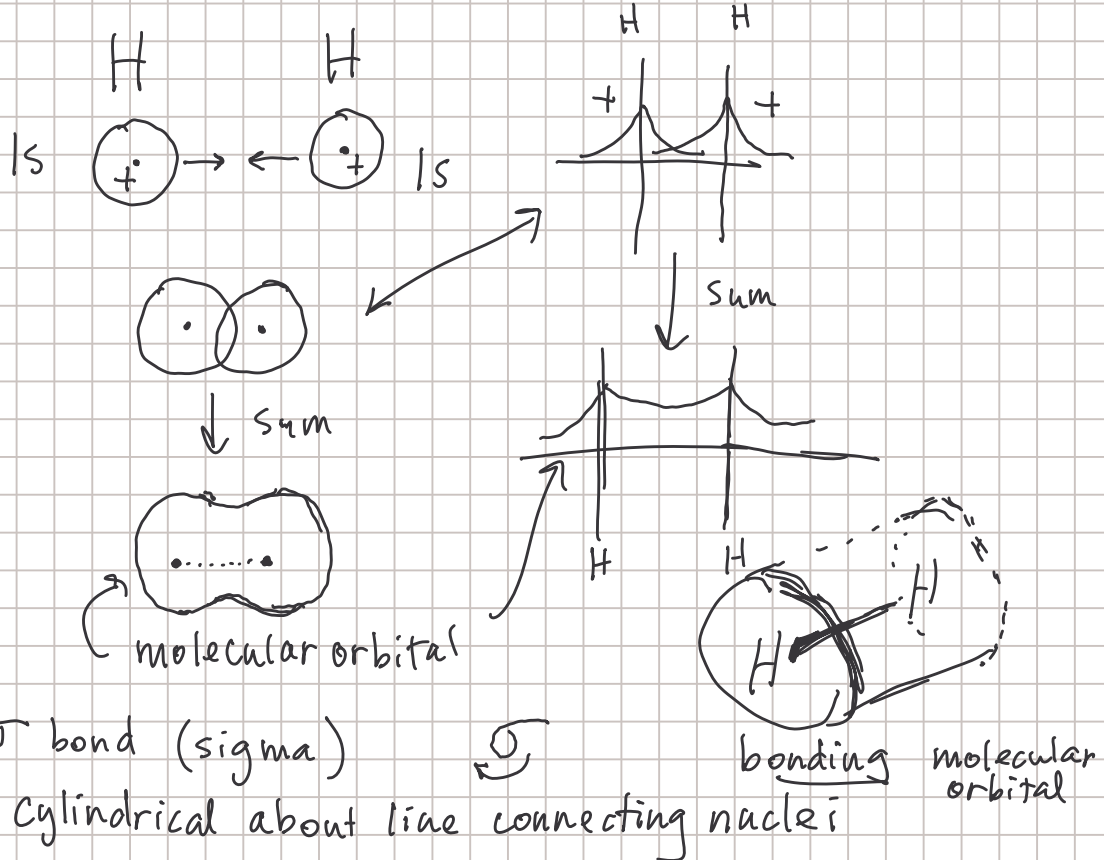
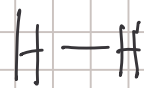
Note Title

8/31/2005

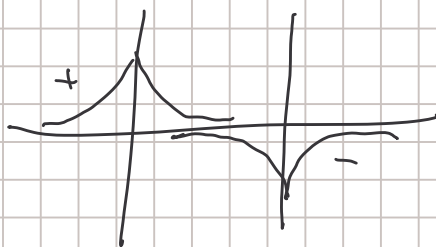
Lab report due Tues

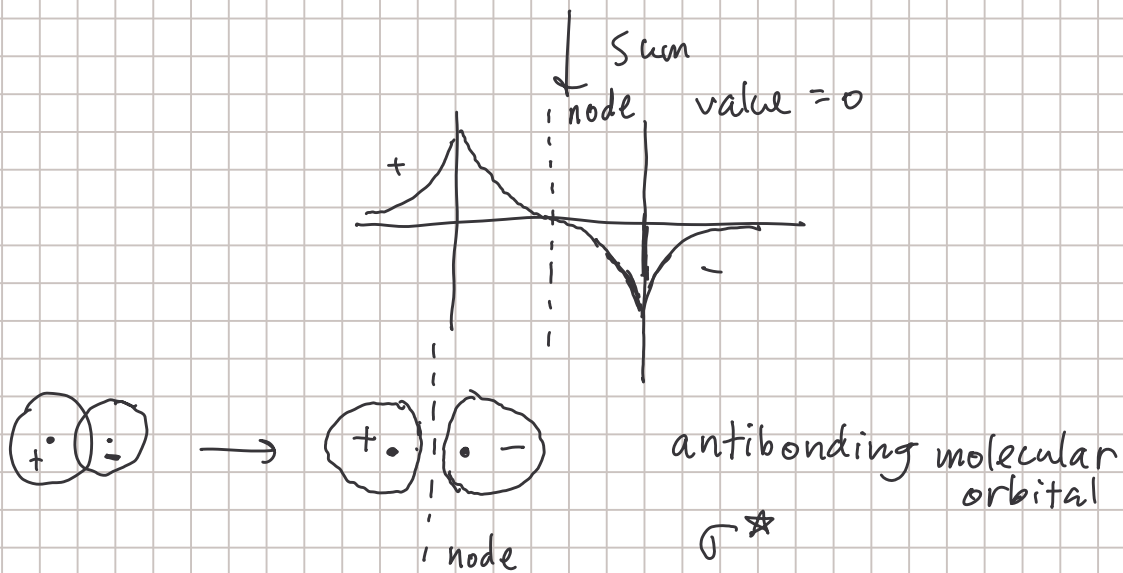


H<sub>2</sub> molecule



opposite  
phases  
overlap:



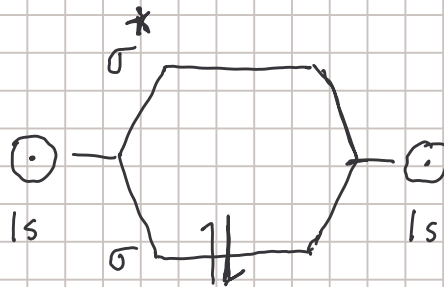


2 atomic orbitals  $\longrightarrow$  2 molecular orbitals

1s, 1s

$\sigma$ ,  $\sigma^*$

Orbital energy diagram

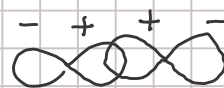
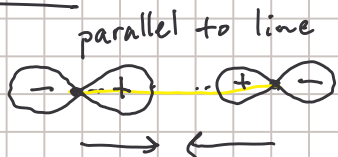


$\sigma^*$ : unoccupied  
 $\sigma$  orbital: occupied

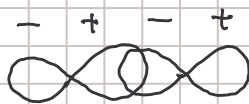
bonding orbitals are lower in energy than antibonding orbitals

both  $e^-$  reside in lower energy  $\sigma$  bond.

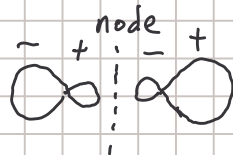
P orbitals can also combine to form MOs



Constructive (same phase overlaps)



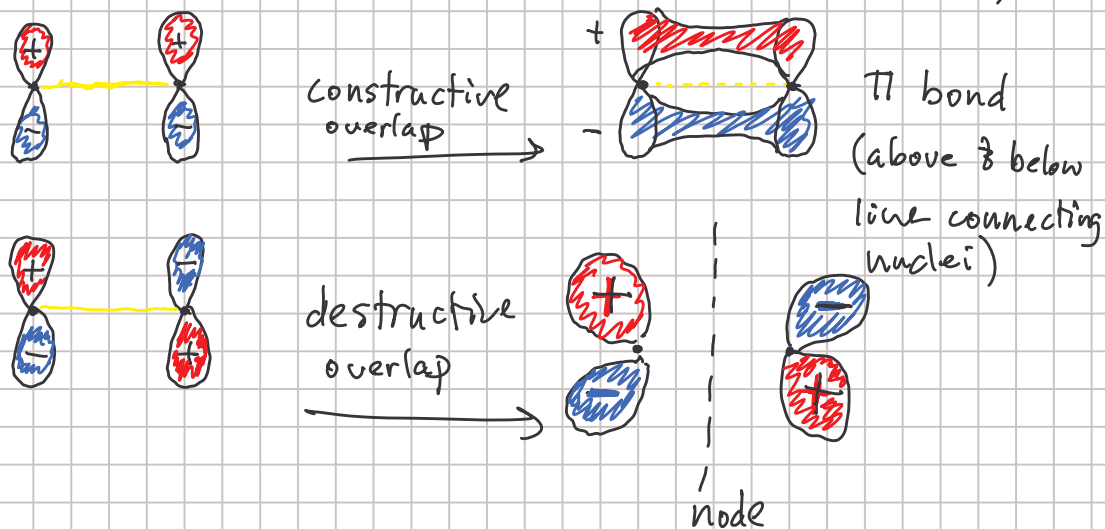
destructive overlap



$\sigma^*$  antibonding

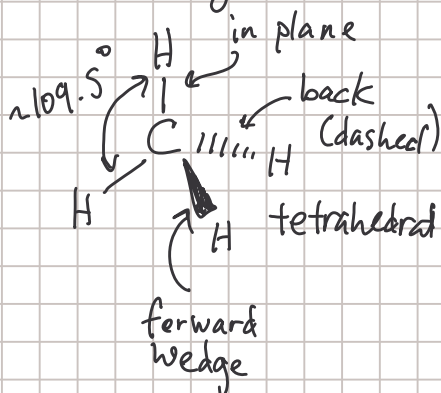
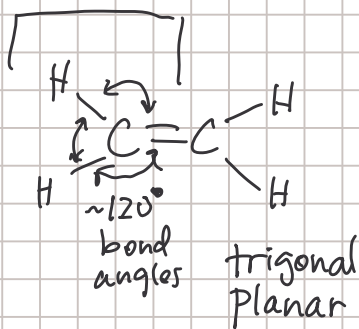
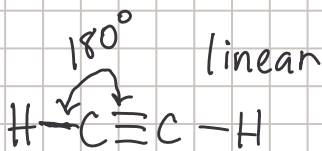
$\pi$  bonding  
( $\pi$ )

overlap between 2 p-orbitals  
(p-orbitals perpendicular to line connecting nuclei)



VSEPR valence shell electron pair repulsion

$e^-$  pairs repel each other to make max. bond angles

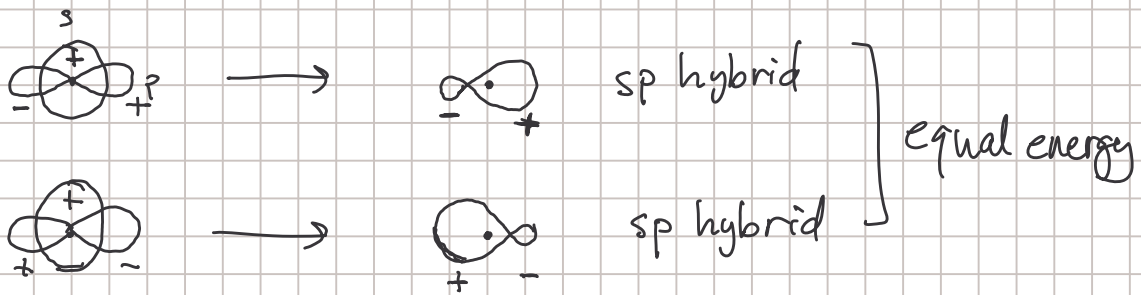


Hybrid orbitals

determine bond angles (geometry of bonds around atoms)

Combination of s & p orbitals on SAME ATOM

S + P → sp hybrid orbitals



when atom needs to make 2 bonds

