

1. Draw the Lewis structure for water, H<sub>2</sub>O.

$$\begin{array}{l} \text{H } 2 \times 1 = 2 \\ \text{O } 6 \times 1 = 6 \\ \hline 8 \end{array}$$



a) How many "groups" (atoms and lone pairs) surround the central oxygen? 4

b) What is the **geometry** of this molecule (look at atoms and lone pairs)? Draw this VSEPR structure next to the Lewis structure.

tetrahedral

c) What is the **shape** of this molecule (look only at the atoms)?

Bent

d) What is the H-O-H bond angle?

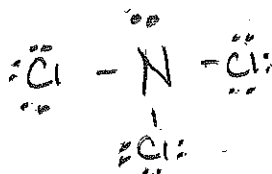
109°

e) Place the partial positive and negative charges on the H and O atoms, based on their relative electronegativities. Is water a **polar** compound?



2. Draw the Lewis structure for NCl<sub>3</sub>

$$\begin{array}{l} \text{N } 1 \times 5 = 5 \\ \text{Cl } 3 \times 7 = 21 \\ \hline 26 \end{array}$$



a) How many "groups" (atoms and lone pairs) surround the central nitrogen? 4

b) What is the **geometry** of this molecule (look at atoms and lone pairs)? Draw this VSEPR structure next to the Lewis structure.

tetrahedral

c) What is the **shape** of this molecule (look only at the atoms)? +

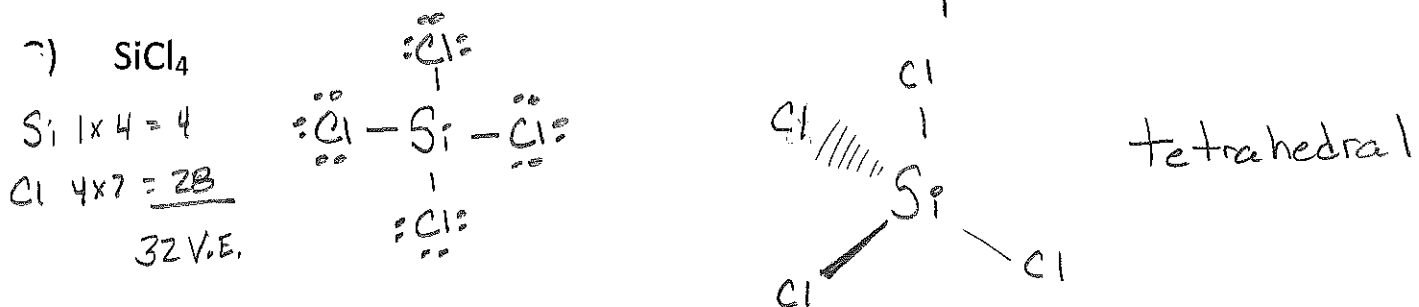
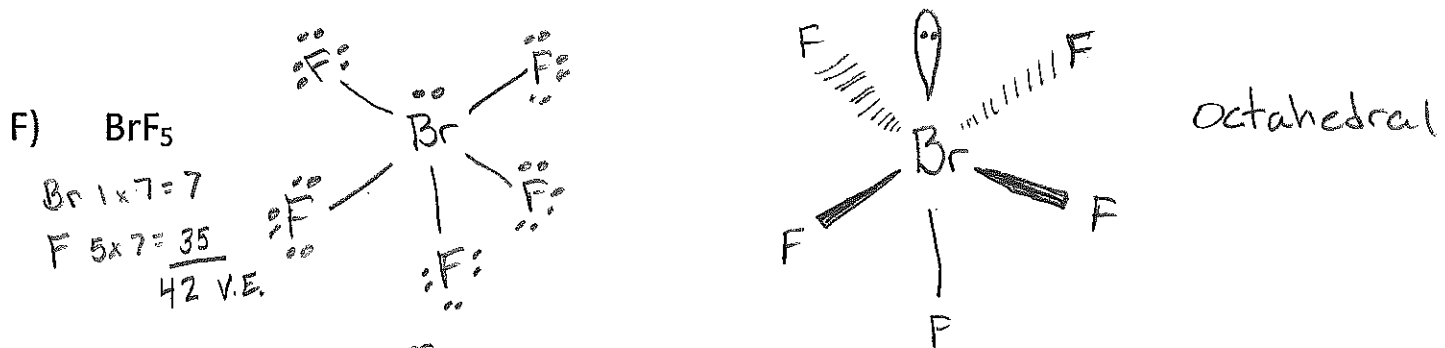
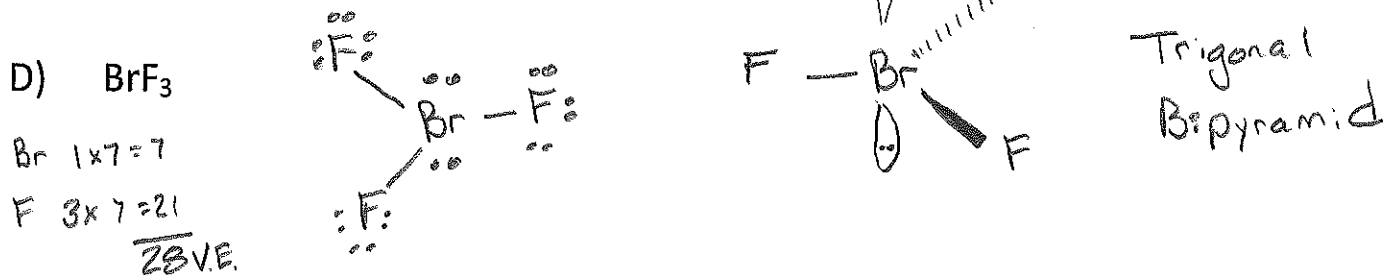
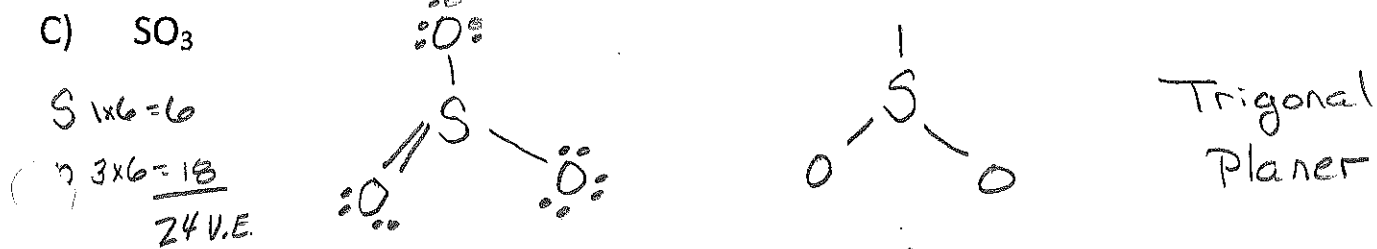
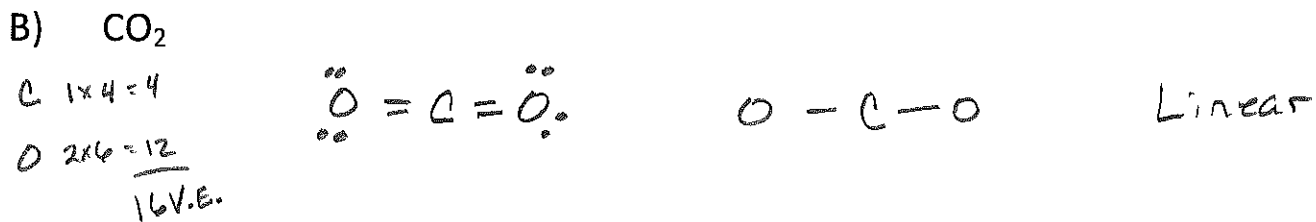
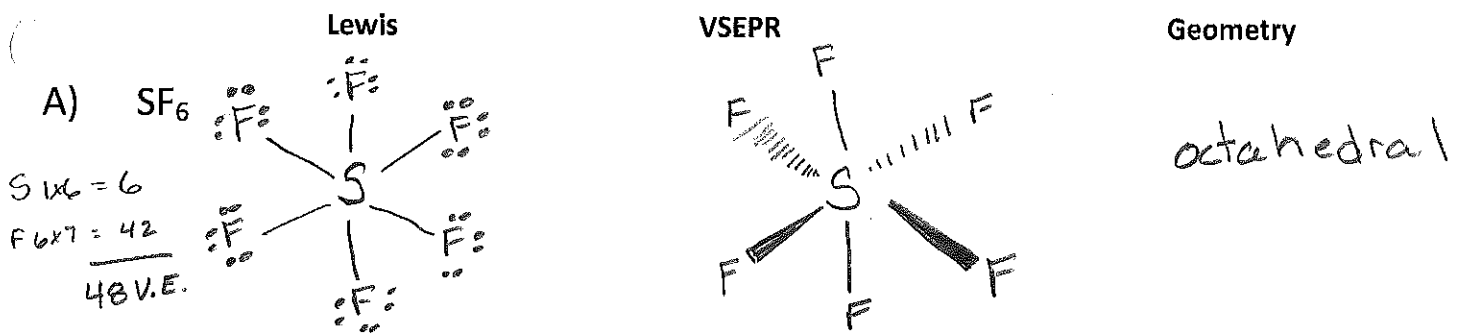
d) What is the + bond angle?

trigonal pyramid

109°



3. Draw the Lewis and VSEPR structures for the following compounds and them with their geometry.



4. Fill in the missing information in the chart using the structures you have drawn in part 3

Compound	Atoms on Central Atom	Lone pairs on Central Atom	Geometry	Shape	Polar or nonpolar?
SF <sub>6</sub>	6	0	octahedral	octahedral	NO
CO <sub>2</sub>	2	0	Linear	Linear	NO
SO <sub>3</sub>	3	0	trigonal Planar	trigonal planar	NO
BrF <sub>3</sub>	3	2	trigonal Bi. pyramidal	T-Shape	YES
BrF <sub>5</sub>	5	1	octahedral	Square pyramid	YES
SiCl <sub>4</sub>	4	0	tetrahedral	tetrahedral	NO