**VSEPR Theory Worksheet – Predicting Molecular Geometry Name:**

**Advanced Chemistry Block \_\_\_\_\_ Date \_\_\_\_\_\_\_**

1. Explain the “duet” and “octet” rules. Which elements does each rule apply to?
2. What is a “lone pair?” How does it affect the molecular geometry?
3. What is the main idea in the Valence Shell Electron Pair Repulsion theory?
4. According to the VSEPR model, the arrangements of electron pairs around NH3 and CH4

a. are different because there is a different number of atoms around the central atom.

b. are different because there is a different number of electron pairs around the central atom.

c. are the same because both nitrogen and carbon are in the second period.

d. are the same because there is the same number of electron pairs around the central atom.

e. Both a and b are correct.

Provide support for your answer.

1. Go back through your notes and describe the **Δ**EN would be found for a polar bond between two atoms.
2. Describe how you determine if a molecule is polar or non polar.
3. Review Lewis structures and VSEPR theory by completing the following table.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Molecule or ion** | **Lewis dot structure** | **# e domains**  **# e Bonded**  **# Lone pair e** | **Molecular Geometry** | **Calc ΔEN**  For ea bond  Draw in all polar bonds | **Bond angle and hybrid** | **Is this a polar molecule?** |
| HF |  |  |  |  |  |  |
| N2 |  |  |  |  |  |  |
| PCl3 |  |  |  |  |  |  |
| CF4 |  |  |  |  |  |  |
| H2S |  |  |  |  |  |  |
| NO3- |  |  |  |  |  |  |
| NH4+ |  |  |  |  |  |  |
| SO2 |  |  |  |  |  |  |
| O2 |  |  |  |  |  |  |
| C3H6 |  |  |  |  |  |  |
| C2H6O |  |  |  |  |  |  |
| HCN |  |  |  |  |  |  |