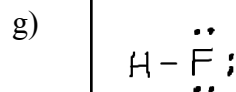
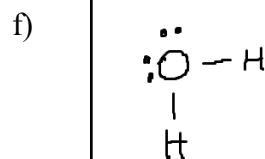
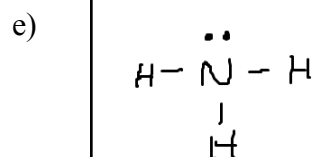
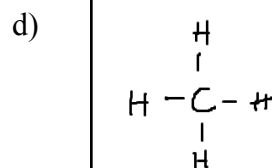
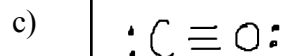
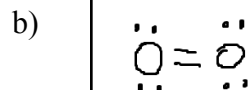
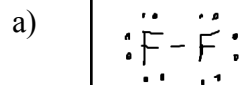


2

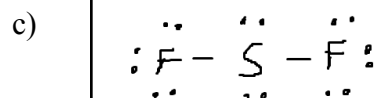
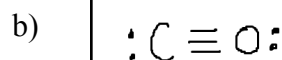
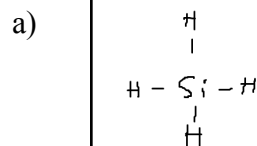
81. Write Lewis structures that obey the octet rule (duet rule for H) for each of the following molecules. Carbon is the central atom in CH_4 , nitrogen is the central atom in NH_3 , and oxygen is the central atom in H_2O .

- a. F_2 e. NH_3
 b. O_2 f. H_2O
 c. CO g. HF
 d. CH_4



4

8.45 Draw Lewis structures for the following: (a) SiH_4 , (b) CO , (c) SF_2 , (d) H_2SO_4 (H is bonded to O), (e) ClO_2^- , (f) NH_2OH .



	d)	$\begin{array}{c} \text{:}\ddot{\text{O}}\text{:} \\ \\ \text{H} - \ddot{\text{O}} - \text{S} - \ddot{\text{O}} - \text{H} \\ \\ \text{:}\ddot{\text{O}}\text{:} \end{array}$
	e)	$\left[\text{:}\ddot{\text{O}}\text{:} - \ddot{\text{Cl}} - \ddot{\text{O}}\text{:} \right]^{-1}$
	f)	$\begin{array}{c} \text{H} - \ddot{\text{N}} - \ddot{\text{O}} - \text{H} \\ \\ \text{H} \end{array}$

7


84. Write Lewis structures that obey the octet rule for each of the following molecules and ions. (In each case the first atom listed is the central atom.)

a. POCl_3 , SO_4^{2-} , XeO_4 , PO_4^{3-} , ClO_4^-

b. NF_3 , SO_3^{2-} , PO_3^{3-} , ClO_3^-

c. ClO_2^- , SCl_2 , PCl_2^-

d. Considering your answers to parts a, b, and c, what conclusions can you draw concerning the structures of species containing the same number of atoms and the same number of valence electrons?

a)	b)	c)
$\begin{array}{c} \text{:}\ddot{\text{O}}\text{:} \\ \\ \text{:}\ddot{\text{Cl}}\text{:} - \text{P} - \ddot{\text{Cl}}\text{:} \\ \\ \text{:}\ddot{\text{Cl}}\text{:} \end{array}$	$\begin{array}{c} \text{:}\ddot{\text{F}}\text{:} \quad \ddot{\text{N}} \quad \text{:}\ddot{\text{F}}\text{:} \\ \\ \text{:}\ddot{\text{F}}\text{:} \end{array}$	$\left[\text{:}\ddot{\text{O}}\text{:} - \ddot{\text{Cl}} - \ddot{\text{O}}\text{:} \right]^{-1}$
$\left[\begin{array}{c} \text{:}\ddot{\text{O}}\text{:} \\ \\ \text{:}\ddot{\text{O}}\text{:} - \text{S} - \ddot{\text{O}}\text{:} \\ \\ \text{:}\ddot{\text{O}}\text{:} \end{array} \right]^{-2}$	$\left[\begin{array}{c} \text{:}\ddot{\text{O}}\text{:} - \text{S} - \ddot{\text{O}}\text{:} \\ \\ \text{:}\ddot{\text{O}}\text{:} \end{array} \right]^{-2}$	$\text{:}\ddot{\text{Cl}}\text{:} - \ddot{\text{S}} - \ddot{\text{Cl}}\text{:}$
$\begin{array}{c} \text{:}\ddot{\text{O}}\text{:} \\ \\ \text{:}\ddot{\text{O}}\text{:} - \text{Xe} - \ddot{\text{O}}\text{:} \\ \\ \text{:}\ddot{\text{O}}\text{:} \end{array}$	$\left[\begin{array}{c} \text{:}\ddot{\text{O}}\text{:} - \text{P} - \ddot{\text{O}}\text{:} \\ \\ \text{:}\ddot{\text{O}}\text{:} \end{array} \right]^{-3}$	
$\left[\begin{array}{c} \text{:}\ddot{\text{O}}\text{:} \\ \\ \text{:}\ddot{\text{O}}\text{:} - \text{P} - \ddot{\text{O}}\text{:} \\ \\ \text{:}\ddot{\text{O}}\text{:} \end{array} \right]^{-3}$	$\left[\begin{array}{c} \text{:}\ddot{\text{O}}\text{:} - \ddot{\text{Cl}} - \ddot{\text{O}}\text{:} \\ \\ \text{:}\ddot{\text{O}}\text{:} \end{array} \right]^{-1}$	
$\left[\begin{array}{c} \text{:}\ddot{\text{O}}\text{:} \\ \\ \text{:}\ddot{\text{O}}\text{:} - \ddot{\text{Cl}} - \ddot{\text{O}}\text{:} \\ \\ \text{:}\ddot{\text{O}}\text{:} \end{array} \right]^{-1}$		

	d) They have similar Lewis structures															
8																
85. One type of exception to the octet rule are compounds with central atoms having fewer than eight electrons around them. BeH ₂ and BH ₃ are examples of this type of exception. Draw the Lewis structures for BeH ₂ and BH ₃ .	$\text{H} \sim \text{Be} - \text{H}$ $\begin{array}{c} \text{H} \sim \text{B} - \text{H} \\ \\ \text{H} \end{array}$															
9																
8.62 Draw the Lewis structures for each of the following molecules or ions. Which do not obey the octet rule? (a) NH ₄ ⁺ , (b) SCN ⁻ , (c) PCl ₃ , (d) TeF ₄ , (e) XeF ₂ .	<table><tr><td>a)</td><td>$\left[\begin{array}{c} \text{H} \\ \\ \text{H} - \text{N} - \text{H} \\ \\ \text{H} \end{array} \right]^+$</td><td>obey</td></tr><tr><td>b)</td><td>$\left[\begin{array}{c} \cdot\cdot \\ \cdot\cdot \\ \text{S} \\ \cdot\cdot \\ \cdot\cdot \end{array} = \text{C} = \begin{array}{c} \cdot\cdot \\ \cdot\cdot \\ \text{N} \\ \cdot\cdot \\ \cdot\cdot \end{array} \right]^-$</td><td>obey</td></tr><tr><td>c)</td><td>$\begin{array}{c} \cdot\cdot \quad \cdot\cdot \quad \cdot\cdot \\ \cdot\cdot \quad \cdot\cdot \quad \cdot\cdot \\ :\text{Cl} - \text{P} - \text{Cl}: \\ \\ :\text{Cl}: \\ \cdot\cdot \end{array}$</td><td>obey</td></tr><tr><td>d)</td><td>$\begin{array}{c} \cdot\cdot \\ :\text{F}: \\ \\ :\text{F}: - \text{Te} - :\text{F}: \\ \\ :\text{F}: \\ \cdot\cdot \end{array}$</td><td>not obey</td></tr><tr><td>e)</td><td>$\begin{array}{c} \cdot\cdot \quad \cdot\cdot \quad \cdot\cdot \\ \cdot\cdot \quad \cdot\cdot \quad \cdot\cdot \\ :\text{F} - \text{Xe} - \text{F}: \\ \cdot\cdot \quad \cdot\cdot \quad \cdot\cdot \end{array}$</td><td>not obey</td></tr></table>	a)	$\left[\begin{array}{c} \text{H} \\ \\ \text{H} - \text{N} - \text{H} \\ \\ \text{H} \end{array} \right]^+$	obey	b)	$\left[\begin{array}{c} \cdot\cdot \\ \cdot\cdot \\ \text{S} \\ \cdot\cdot \\ \cdot\cdot \end{array} = \text{C} = \begin{array}{c} \cdot\cdot \\ \cdot\cdot \\ \text{N} \\ \cdot\cdot \\ \cdot\cdot \end{array} \right]^-$	obey	c)	$\begin{array}{c} \cdot\cdot \quad \cdot\cdot \quad \cdot\cdot \\ \cdot\cdot \quad \cdot\cdot \quad \cdot\cdot \\ :\text{Cl} - \text{P} - \text{Cl}: \\ \\ :\text{Cl}: \\ \cdot\cdot \end{array}$	obey	d)	$\begin{array}{c} \cdot\cdot \\ :\text{F}: \\ \\ :\text{F}: - \text{Te} - :\text{F}: \\ \\ :\text{F}: \\ \cdot\cdot \end{array}$	not obey	e)	$\begin{array}{c} \cdot\cdot \quad \cdot\cdot \quad \cdot\cdot \\ \cdot\cdot \quad \cdot\cdot \quad \cdot\cdot \\ :\text{F} - \text{Xe} - \text{F}: \\ \cdot\cdot \quad \cdot\cdot \quad \cdot\cdot \end{array}$	not obey
a)	$\left[\begin{array}{c} \text{H} \\ \\ \text{H} - \text{N} - \text{H} \\ \\ \text{H} \end{array} \right]^+$	obey														
b)	$\left[\begin{array}{c} \cdot\cdot \\ \cdot\cdot \\ \text{S} \\ \cdot\cdot \\ \cdot\cdot \end{array} = \text{C} = \begin{array}{c} \cdot\cdot \\ \cdot\cdot \\ \text{N} \\ \cdot\cdot \\ \cdot\cdot \end{array} \right]^-$	obey														
c)	$\begin{array}{c} \cdot\cdot \quad \cdot\cdot \quad \cdot\cdot \\ \cdot\cdot \quad \cdot\cdot \quad \cdot\cdot \\ :\text{Cl} - \text{P} - \text{Cl}: \\ \\ :\text{Cl}: \\ \cdot\cdot \end{array}$	obey														
d)	$\begin{array}{c} \cdot\cdot \\ :\text{F}: \\ \\ :\text{F}: - \text{Te} - :\text{F}: \\ \\ :\text{F}: \\ \cdot\cdot \end{array}$	not obey														
e)	$\begin{array}{c} \cdot\cdot \quad \cdot\cdot \quad \cdot\cdot \\ \cdot\cdot \quad \cdot\cdot \quad \cdot\cdot \\ :\text{F} - \text{Xe} - \text{F}: \\ \cdot\cdot \quad \cdot\cdot \quad \cdot\cdot \end{array}$	not obey														
11																
88. SF ₆ , ClF ₅ , and XeF ₄ are three compounds whose central atoms do not follow the octet rule. Draw Lewis structures for these compounds.																

