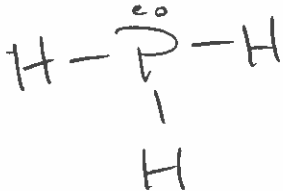
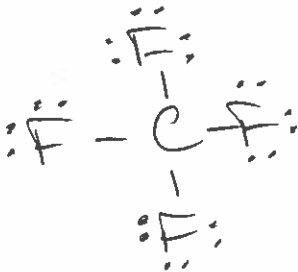
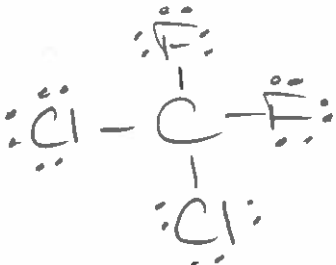



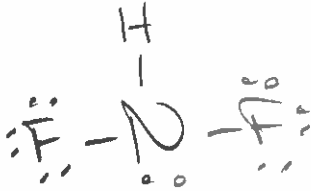
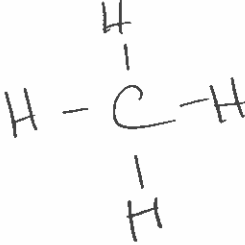
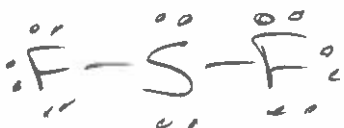


Count the valence electrons in each molecule below, and draw Lewis structures for them.

Part I. Simple structures. None of these molecules have formal charges or common resonance structures.

PH_3 #e ⁻ <u>8</u> 	CF_4 #e ⁻ <u>32</u> 	CCl_2F_2 #e ⁻ <u>32</u> 
H_2O #e ⁻ <u>8</u> 	N_2 #e ⁻ <u>10</u> 	F_2 #e ⁻ <u>14</u> 
NHF_2 #e ⁻ <u>20</u> 	CH_4 #e ⁻ <u>8</u> 	SF_2 #e ⁻ <u>20</u> 

Part II. Structures with possible formal charges. Draw one valid Lewis structure, and show all nonzero formal charges.

H_3O^+ #e ⁻ <u>8</u> 	NH_3 #e ⁻ <u>8</u> 	SO_2 #e ⁻ <u>18</u>
NO_2^- #e ⁻ <u>18</u> 	AsCl_5 #e ⁻ <u>40</u> 	XeF_4 #e ⁻ <u>36</u>
O_3 #e ⁻ <u>18</u> 	N_2O #e ⁻ <u>16</u> 	I_3^- #e ⁻ <u>22</u>
SF_6 #e ⁻ <u>48</u> 	CN^- #e ⁻ <u>10</u> 	NO_3^- #e ⁻ <u>24</u>

Part III. Free-for-all! In this section, draw the Lewis structure and any valid resonance structures. Label each structure with a letter (A, B, C, etc.), and indicate which is the best. If they are all equally good, then write *equivalent*.

<p>CNO⁻</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> $\text{:}\ddot{\text{N}}\equiv\text{C}-\ddot{\text{O}}\text{:}^-$ A </div> <div style="text-align: center;"> $\text{:}\overset{+}{\text{N}}-\text{C}\equiv\text{O}\text{:}$ B </div> <div style="text-align: center;"> $\text{:}\overset{-}{\text{N}}=\text{C}=\ddot{\text{O}}\text{:}$ C </div> </div>	<p>#e⁻ <u>16</u></p> <p>best structure: <u>A</u></p>
<p>CS₂</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> $\text{:}\ddot{\text{S}}=\text{C}=\ddot{\text{S}}\text{:}$ A </div> <div style="text-align: center;"> $\text{:}\overset{+}{\text{S}}\equiv\text{C}-\ddot{\text{S}}\text{:}^-$ B </div> <div style="text-align: center;"> $\text{:}\overset{-}{\text{S}}-\text{C}\equiv\text{S}\text{:}^+$ C </div> </div>	<p>#e⁻ <u>16</u></p> <p>best structure: <u>A</u></p>
<p>N₃⁻</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> $\text{:}\overset{+}{\text{N}}=\text{N}-\overset{-}{\text{N}}\text{:}$ A </div> <div style="text-align: center;"> $\text{:}\overset{-}{\text{N}}-\overset{+}{\text{N}}\equiv\text{N}\text{:}$ B </div> <div style="text-align: center;"> $\text{:}\overset{-}{\text{N}}=\overset{+}{\text{N}}=\overset{-}{\text{N}}\text{:}$ C </div> </div>	<p>#e⁻ <u>16</u></p> <p>best structure: <u>C</u></p>
<p>CO₃²⁻</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> $\text{:}\ddot{\text{O}}\text{:}=\text{C}-\ddot{\text{O}}\text{:}^-$ A </div> <div style="text-align: center;"> $\text{:}\ddot{\text{O}}\text{:}=\text{C}-\ddot{\text{O}}\text{:}^-$ B </div> <div style="text-align: center;"> $\text{:}\ddot{\text{O}}\text{:}=\text{C}-\ddot{\text{O}}\text{:}^-$ C </div> </div>	<p>#e⁻ <u>24</u></p> <p>best structure: <u>Equivalent</u></p>



<p>N_2O</p> <div><div>$\text{:}\overset{\ominus}{\text{N}}\text{--}\overset{\oplus}{\text{N}}\equiv\overset{\oplus}{\text{O}}\text{:}$ A</div><div>$\text{N}\equiv\overset{\oplus}{\text{N}}\text{--}\overset{\ominus}{\text{O}}\text{:}$ B</div><div>$\overset{\ominus}{\text{N}}=\overset{\oplus}{\text{N}}=\overset{\ominus}{\text{O}}\text{:}$ C</div></div>	<p>#e⁻ <u>16</u></p> <p>best structure: <u>B</u></p>
<p>SO_3</p> <div><div>$\text{:}\overset{\ominus}{\text{O}}\text{--}\overset{\oplus}{\text{S}}\text{=}\overset{\ominus}{\text{O}}\text{:}$ A</div><div>$\text{:}\overset{\ominus}{\text{O}}\text{--}\overset{\oplus}{\text{S}}\text{=}\overset{\ominus}{\text{O}}\text{:}$ C</div><div>$\text{:}\overset{\ominus}{\text{O}}\text{--}\overset{\oplus}{\text{S}}\text{=}\overset{\ominus}{\text{O}}\text{:}$ E</div><div>$\text{:}\overset{\ominus}{\text{O}}\text{=}\overset{\oplus}{\text{S}}\text{--}\overset{\ominus}{\text{O}}\text{:}$ B</div><div>$\text{:}\overset{\ominus}{\text{O}}\text{=}\overset{\oplus}{\text{S}}\text{=}\overset{\ominus}{\text{O}}\text{:}$ D</div><div>$\text{:}\overset{\ominus}{\text{O}}\text{=}\overset{\oplus}{\text{S}}\text{=}\overset{\ominus}{\text{O}}\text{:}$ F</div><div>$\text{:}\overset{\ominus}{\text{O}}\text{=}\overset{\oplus}{\text{S}}\text{=}\overset{\ominus}{\text{O}}\text{:}$ G</div></div>	<p>#e⁻ <u>24</u></p> <p>best structure: <u>G</u></p>

