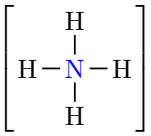
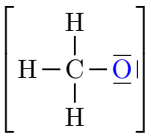
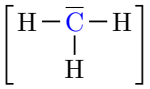
Full Name: February 22, 2023

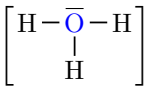
0.1 Indicate the charge of the atom marked blue in the following electron-dot structure:

(a) 

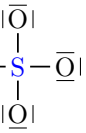
(b) 

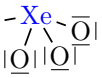
0.2 Indicate the charge of the atom marked blue in the following electron-dot structure:

(a) 

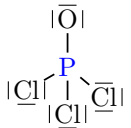
(b) 

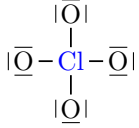
0.3 Indicate the charge of the atom marked blue in the following electron-dot structure that follow the octet rule:

(a) 

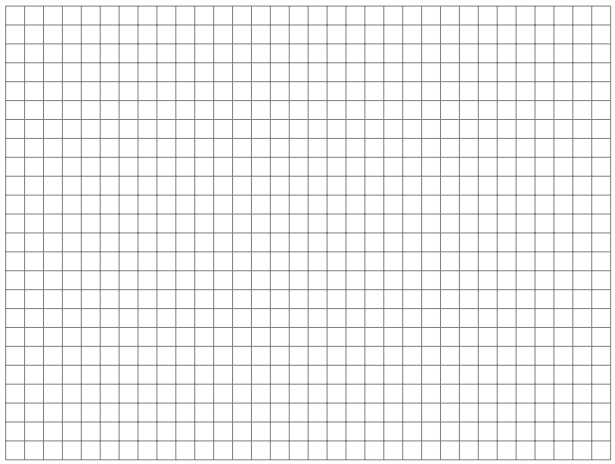
(b) 

0.4 Indicate the charge of the atom marked blue in the following electron-dot structure that follow the octet rule:

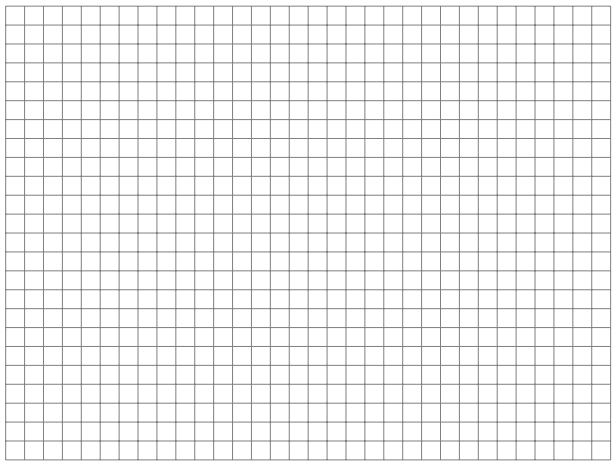
(a) 

(b) 

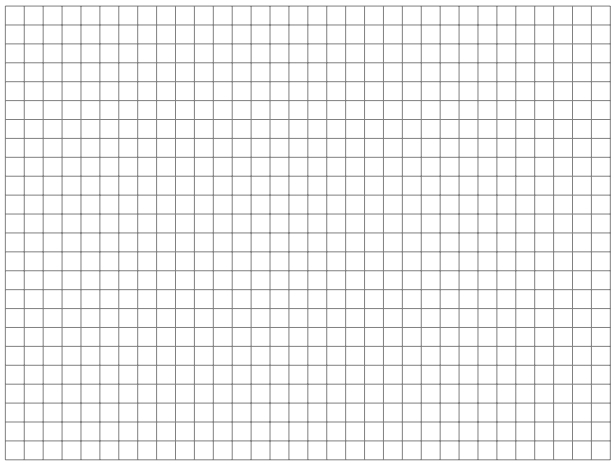
0.5 Draw electron-dot structures for the following molecules that obey the octet rule, given that the first atom listed is the central atom: (a) HF (b) HCl



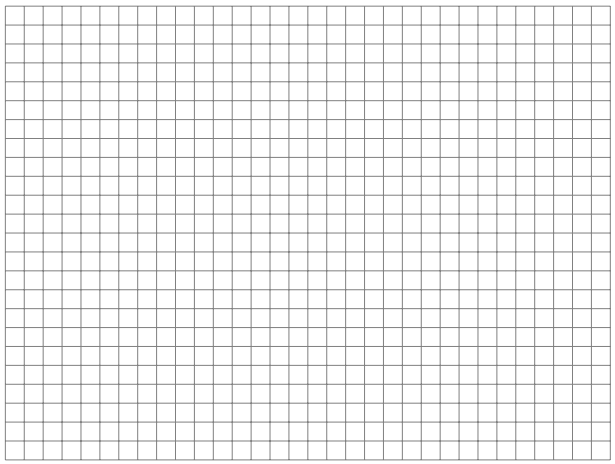
0.6 Draw electron-dot structures for the following molecules that obey the octet rule, given that the first atom listed is the central atom: (a) F_2 (b) O_2



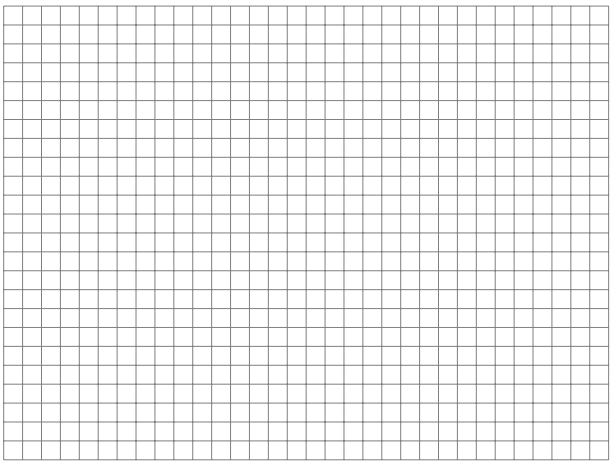
0.7 Draw electron-dot structures for the following molecules that obey the octet rule, given that the first atom listed is the central atom: (a) CO (b) NO



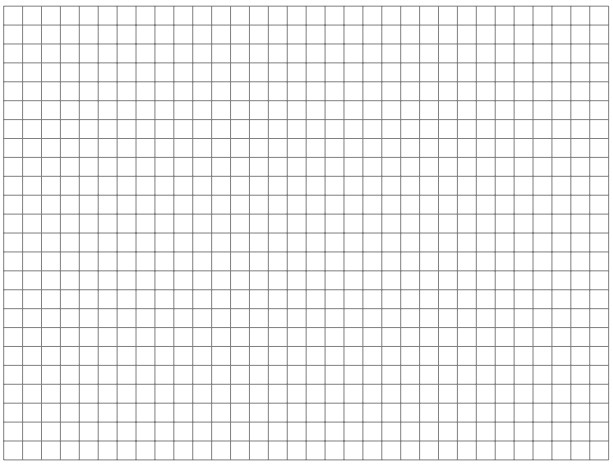
0.8 Draw electron-dot structures for the following molecules that obey the octet rule, given that the first atom listed is the central atom: (a) ICl (b) HI



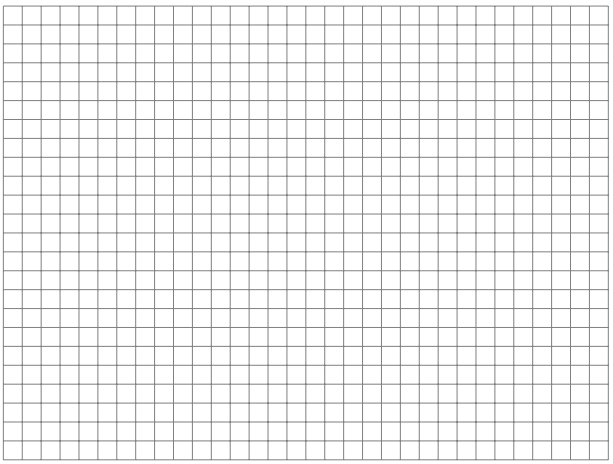
0.9 Draw electron-dot structures for the following molecules that obey the octet rule, given that the first atom listed is the central atom: (a) CH_4 (b) CH_3Cl (c) OH_2



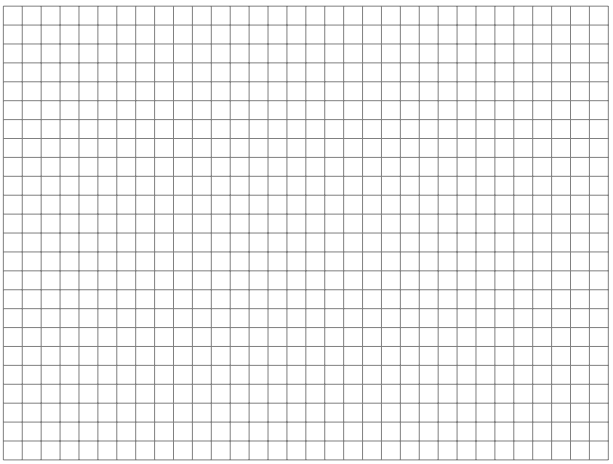
0.10 Draw electron-dot structures for the following molecules that obey the octet rule, given that the first atom listed is the central atom: (a) HCN (b) CO_2



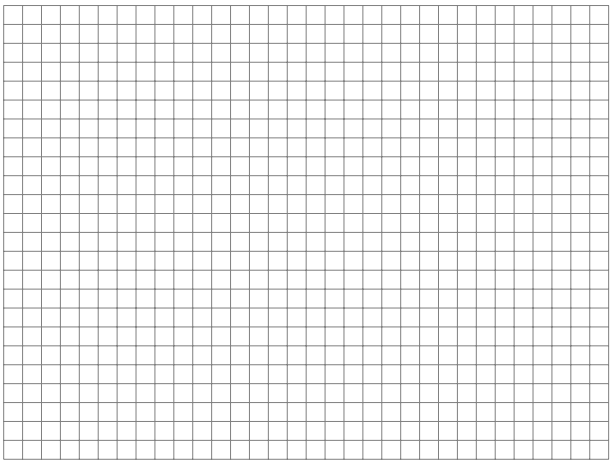
0.11 Draw electron-dot structures for the following molecules that obey the octet rule, given that the first atom listed is the central atom: (a) $SeCl_2$ (b) CH_2O



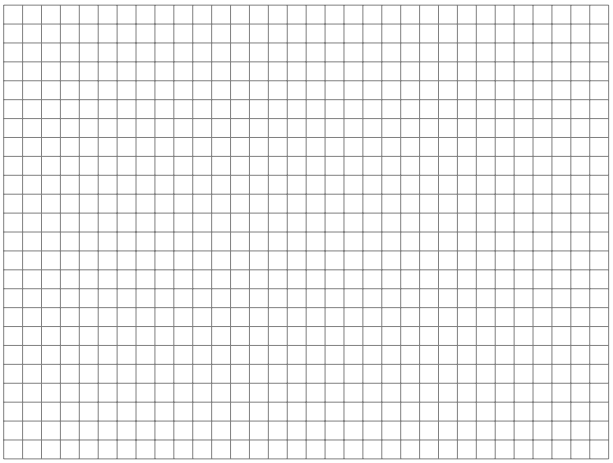
0.12 Draw electron-dot structures for the following molecules that obey the octet rule, given that the first atom listed is the central atom: (a) NH_3 (b) NCl_3



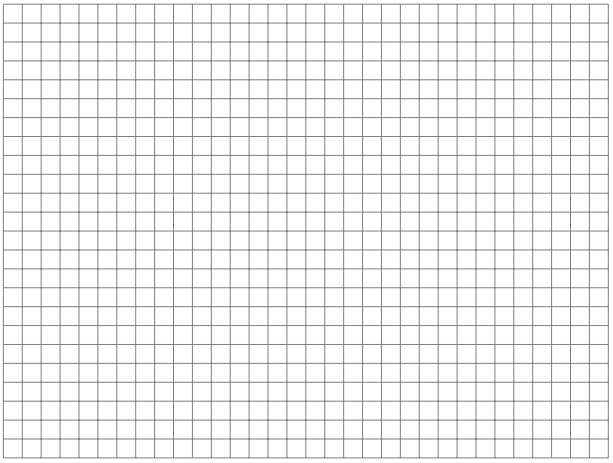
0.13 Draw electron-dot structures for the following molecules given that the first atom listed is the central atom. Some of the atoms might not obey the octet rule. If the species has a charge indicate the location of the charge: (a) BeH_2 (b) PCl_5 (c) SF_4 (d) ClF_3



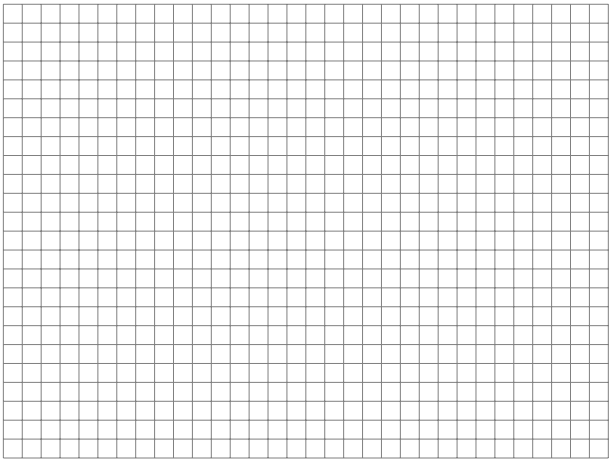
0.14 Draw electron-dot structures for the following molecules given that the first atom listed is the central atom. Some of the atoms might not obey the octet rule. If the species has a charge indicate the location of the charge: (a) BH_3 (b) BH_2F (c) $POCl_3$ (d) ClO_4^-



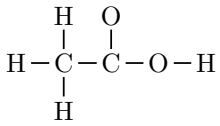
0.15 Draw electron-dot structures for the following molecules given that the first atom listed is the central atom. Some of the atoms might not obey the octet rule. If the species has a charge indicate the location of the charge: (a) ClF_5 (b) XeF_4



0.16 Draw electron-dot structures for the following molecules given that the first atom listed is the central atom. Some of the atoms might not obey the octet rule. If the species has a charge indicate the location of the charge: (a) I_3^- (b) Br_3^- (c) SF_6

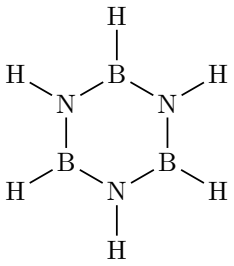


0.17 Given the skeletal structure below, draw the lewis structure of the molecule:

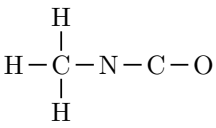


0.18

0.19 Given the skeletal structure below, draw the lewis structure of the molecule:



0.20 Given the skeletal structure below, draw the lewis structure of the molecule:



0.21 Indicate the hybridization of: (a) NH_3 (b) CH_4 (c) H_2O

0.22 Indicate the hybridization of: (a) NH_3 (b) CH_4 (c) H_2O

0.23 Using the MO order provided below

$$\sigma_{2s}\sigma^*_{2s}\pi_{2p}\sigma_{2p}\pi^*_{2p}\sigma^*_{2p}$$

obtain the MO configuration for: (a) O_2 (b) $F_2{}^+$

0.24 Using the MO order provided below

$$\sigma_{2s}\sigma^*_{2s}\pi_{2p}\sigma_{2p}\pi^*_{2p}\sigma^*_{2p}$$

obtain the MO configuration for: (a) B_2 (b) C_2

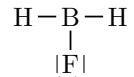
0.25 Indicate the magnetic (paramagnetic or diamagnegtic) configuration of the molecule with MO configuration: $\sigma^2_{2s}\sigma^{2*}_{2s}\sigma^2_{2p}\pi^4_{2p}\pi^{2*}_{2p}$

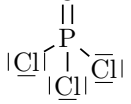
0.26 Indicate the magnetic (paramagnetic or diamagnegtic) configuration of the molecule with MO configuration: $\sigma^2_{2s}\sigma^{2*}_{2s}\sigma^2_{2p}\pi^4_{2p}\pi^{3*}_{2p}$

0.27 Identify the molecular shape of the molecules: (a) H_2 (b) $BeCl_2$ (c) BF_3

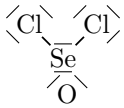
0.28 Identify the molecular shape of the molecules: (a) NH_3 (b) CH_4

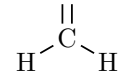
0.29 Given the following Lewis structures, predict the molecular geometry and angles:

(a) 

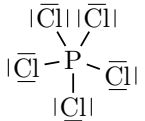
(b) 

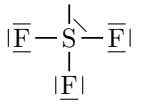
0.30 Given the following Lewis structures, predict the molecular geometry and angles:

(a) 

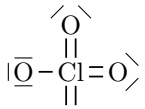
(b) 

0.31 Given the following Lewis structures, predict the molecular geometry and angles:

(a) 

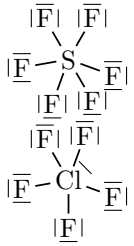
(b) 

0.32 Given the following Lewis structures, predict the molecular geometry and angles:

(a) 

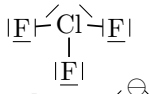
(b) 

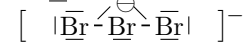
0.33 Given the following Lewis structures, predict the molecular geometry and angles:

(a) 

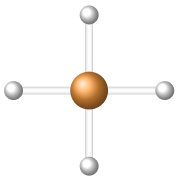
(b)

0.34 Given the following Lewis structures, predict the molecular geometry and angles:

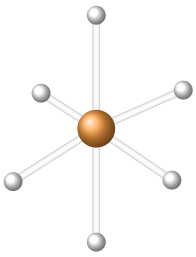
(a) 

(b) 

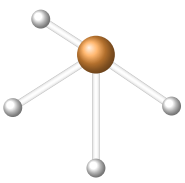
0.35 Identify the name of the following molecular structure:



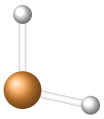
0.36 Identify the name of the following molecular structure:



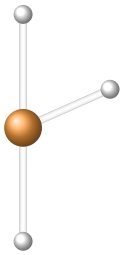
0.37 Identify the name of the following molecular structure:



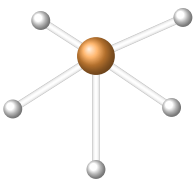
0.38 Identify the name of the following molecular structure:



0.39 Identify the name of the following molecular structure:



0.40 Identify the name of the following molecular structure:



0.41 Indicate the polarity or non-polarity for the following molecules:
(a) NH_3 (b) CO_2

0.42 Indicate the polarity or non-polarity for the following molecules:
(a) H_2O (b) HCl (c) H_2

Answers v. 85 **0.1** (a) +1 (b) -1 **0.2** (a) -2 (b) +1 **0.3** (a) +2 (b) +4 **0.4** (a) +1 (b) +3 **0.5** (a)  (b) **0.6** (a)  (b) **0.7** (a) (b)  **0.8** (a) (b) **0.9** (a) (b)  (c) **0.10** (a) (b) **0.11** (a)  (b) **0.12** (a) (b) **0.13** (a) (b) (c)  (d) **0.14** (a) (b) (c)  (d)  **0.15** (a)  (b)  **0.16** (a)  (b)  (c)  **0.17** 

0.18 **0.19** 

0.20  **0.21** (a) NH_3 (sp^3) (b) CH_4 (sp^3) (c) H_2O (sp^3)

0.22 (a) NH_3 (sp^3) (b) CH_4 (sp^3) (c) H_2O (sp^3) **0.23** (a) O_2 ($\sigma_{2s}^2\sigma_{2s}^{2*}\sigma_{2p}^2\pi_{2p}^4\pi_{2p}^{2*}$) (b) F_2^+ ($\sigma_{2s}^2\sigma_{2s}^{2*}\sigma_{2p}^2\pi_{2p}^4\pi_{2p}^{3*}$) **0.24** (a) B_2 ($\sigma_{2s}^2\sigma_{2s}^{*2}\pi_{2p}^2$) (b) C_2 ($\sigma_{2s}^2\sigma_{2s}^{*2}\pi_{2p}^4$) **0.25** paramagnetic **0.26** paramagnetic **0.27** (a) H_2 (Linear) (b) $BeCl_2$ (Linear) (c) BF_3 (Trigonal planar) **0.28** (a) NH_3 (Trigonal pyramidal) (b) CH_4 (Tetrahedral) **0.29** (a) ABE_3; planar trigonal; 120° (b) AB_4; tetrahedral; 109.5° **0.30** (a) AB_2E_2; bent; 109° (b) AB_2E_2; bent; 109° ABE_3; planar trigonal; 120° **0.31** (a) AB_5; trigonal bipyramidal; 120° and 90° (b) AB_4E; see-saw; 120° and 90° **0.32** (a) AB_4; tetrahedral; 109.5° (b) AB_2; linear; 180° **0.33** (a) AB_6; octahedral; 180° and 90° (b) AB_5E; square pyramidal; 90° **0.34** (a) AB_3E_2; T-shaped; 180° and 90° (b) AB_2E_3; linear; 180° **0.35** square planar **0.36** Octahedral **0.37** see-saw **0.38** bent **0.39** t-shaped **0.40** square pyramidal **0.41** (a) NH_3 (b) CO_2 **0.42** (a) H_2O (b) HCl (c) H_2