Geometry Homework #20

1) If the equation of an ellipse is $\frac{(x+4)^2}{25}+\frac{(y-7)^2}{121}=1$, determine the center and the length of the minor and major axes.
2) Determine the characteristics of the following logical argument and justify your answers by explaining which logical parameters are met, or not met, and why. If a closed figure is a regular octagon, then all of the interior angles of the closed figure are equal.
3) Is the following an example of inductive or deductive reasoning. Assume that all statements/premises are true. If it is deductive, determine which logical parameters are met. If it is inductive, find at least one counterexample, with reasoning, that disproves the conclusion. If the first six numbers of a sequence are 999,994, 999,995, 999,996, 999,997, 999,998, and 999,999, then the seventh number is 1,000,000.
4) Emma, Kristine, Ronnie, and Sarah were recently elected as officers (president, vice president, secretary, and treasurer) of the national mathematics honor society. Determine which person holds which position from the following statements and premises. Sarah is younger than the president but older than the treasurer. Emma and the secretary are both the same age, and they are the youngest members of the group of officers. Ronnie and the secretary are next-door neighbors.
5) If the diameter of a circle is 16 and the center is the point $(-5,6)$, find the equation of the circle.
6) Given: ΔABD with point C being between B and D, with A being between E and D, with A being between B and F, and $\overline{ED}$ and $\overline{BF}$ intersect at point A
   Prove: $\angle BAC+\angle CAD\cong\angle EAF$
7) Given: Points A, B, C, and D are all on the same line, with point C being between A and D, and with point B being between A and C, $\overline{AC}\cong\overline{CD}$
   Prove: $\overline{AB}+\overline{BC}\cong\overline{AD}$
8) Given: ΔABC, ΔEBD, with point B being between E and A, B is the midpoint of $\overline{CD}$, $\overline{AB}\cong\overline{EB}$
   Prove: $\angle BCA\cong\angle BDE$
9) Given: Points A, B, C, and D are all on the same line, with point C being between A and B, and with point D being between B and C, $\overline{AC}\cong\overline{BD}$
   Prove: $\overline{AD}\cong\overline{BC}$
10) Given: $\overline{AE}\perp\overline{BC},\overline{DF}\perp\overline{BC}$ with point B being between A and E, and with point C being between D and F
    Prove: $\overline{AB}\,\mathrm{P}\,\overline{DC}$
11) Given: $\overline{AC}\,\mathrm{P}\,\overline{DF}$, $\overline{AF}$ and $\overline{DC}$ intersect at point E, E is the midpoint of $\overline{AF}$
    Prove: $\overline{DE}\cong\overline{CE}$
12) Given: ΔABC with altitudes $\overline{BD}$ and $\overline{CE}$, $\overline{AD}\cong\overline{CD}$, $\angle ABC\cong\angle ACB$
    Prove: $\overline{AD}\cong\overline{BE}$
13) Given: ΔABC, $\overline{BD}$ is an altitude and $\overline{AD}\cong\overline{CD}$
    Prove: $\overline{AB}\cong\overline{CB}$
14) Given: ΔABC with point E being between points A and C, and point D being between points C and E, $\angle ABE\cong\angle CBD$, $\angle A\cong\angle C$, and $\overline{AE}\cong\overline{CD}$
    Prove: $\angle BEC\cong\angle BDA$

15) Given: ΔABC with medians $\overline{AD}$ and $\overline{CE}$, $\overline{EB} \cong \overline{BD}$
Prove: $\overline{CE} \cong \overline{AD}$

16) Given: ΔABE with, point B being between points C and K, point B being between A and H, point A being between points F and J, point A being between B and G, point E being between points A and J, point E being between B and K, point B being between D and I such that $\overline{CI}$ intersects $\overline{BH}$, $\overline{DB}$ P $\overline{AE}$, $\angle HBI \cong \angle CBD$
Prove: $\angle GAF \cong \angle KEJ$

17) Given: Point C is between A and F, point C is between H and B, point D is between C and F, ΔABC with altitude $\overline{BI}$, ΔFCH with altitude $\overline{DH}$, $\overline{BC} \cong \overline{DC}$, $\overline{CI} \cong \overline{CH}$, $\angle AIB \cong \angle FHD$
Prove: $\overline{AI} \cong \overline{FD}$

18) Given: ΔAEB, ΔCDB, with point B being between A and C, $\overline{BE}$ is a bisector of $\overline{AC}$, $\overline{CD}$ and $\overline{AE}$ intersect at point F, $\overline{BD}$ intersects $\overline{AE}$, $\angle ABD \cong \angle CBE$, $\angle A \cong \angle C$
Prove: $\overline{BD} \cong \overline{BE}$

19) Given: Circle C with chord AB creating ΔABC, Point D is on the circle such that point E is between C and D and point E is between A and B, $\overline{CE}$ is both an altitude and a median of ΔABC
Prove: $\overline{AD} \cong \overline{BD}$

20) Given: Circle C with points A and B both being on the circle, point D is on the exterior of the circle such that $\overline{CD}$ bisects $\angle BCA$
Prove: $\angle BDC \cong \angle ADC$