Geometry Homework #20 – Answer Key

1) Minor axis = 10, major axis = 22, and the center is $(-4,7)$
2) It has consistency because none of the premises contradict each other, there is only one premise. It has validity because a closed figure that is a regular octagon always has equal interior angles. It has soundness because it has validity and the premise is actually true as a closed figure can be a regular octagon. It does not have completeness because if you exchange the premise with the conclusion, the argument does not exhibit soundness. If a closed figure has equal interior angles does guarantee that is a regular octagon…it could be any regular polygon.
3) It is an inductive argument because the conclusion was determined from an inference (educated guess) based on an observed pattern. While the pattern appears to be consecutive natural numbers beginning with 999,994, it could be the mileage count on the odometer of a car. Most cars use a six digit, whole number counter. This means that 999,999 is the largest whole number that can be displayed. Instead of displaying 1,000,000 for the next number, the counter resets to 0 and keeps counting from there. Therefore, the seventh number in the sequence could be 0.
4) Emma: treasurer, Kristine: secretary, Ronnie: president, Sarah: vice president.
5) $(x+5)^2+(y-6)^2=64$
6)

Statements	Reasons
ΔABD with point C being between B and D	Given
$\angle BAC+\angle CAD\cong\angle BAD$	Angle Addition Postulate
$\overline{ED}$ and $\overline{BF}$ intersect at point A	Given
Angles BAD and EAF are vertical	Definition of vertical angles
$\angle BAD\cong\angle EAF$	Vertical angles are congruent
$\angle BAC+\angle CAD\cong\angle EAF$	Transitive

7)

Statements	Reasons
Points A, B, C, and D are all on the same line, point C is between A and D, Point B is between A and C	Given
$\overline{AB}+\overline{BC}\cong\overline{AC}$	Segment Addition Postulate
$\overline{AC}\cong\overline{CD}$	Given
$\overline{AB}+\overline{BC}\cong\overline{CD}$	Transitive

8)

Statements	Reasons
B is the midpoint of $\overline{CD}$	Given
$\overline{CB}\cong\overline{DB}$	Definition of a Midpoint
$\overline{AB}\cong\overline{EB}$	Given
Angles DBE and CBA are vertical	Definition of vertical angles
$\angle DBE\cong\angle CBA$	Vertical angles are congruent
$\Delta DBE\cong\Delta CBA$	SAS
$\angle BCA\cong\angle BDE$	CPCTC

9)

Statements	Reasons
Points A, B, C, and D are all on the same line, point C is between A and B, Point D is between B and C	Given
$\overline{AC}+\overline{CD}\cong\overline{AD}$ and $\overline{BD}+\overline{CD}\cong\overline{BC}$	Segment Addition Postulate
$\overline{AC}\cong\overline{BD}$	Given
$\overline{BD}+\overline{CD}\cong\overline{AD}$ and $\overline{BD}+\overline{CD}\cong\overline{BC}$	Substitution
$\overline{AD}\cong\overline{BC}$	Transitive

10)

Statements	Reasons
$\overline{AE}\perp\overline{BC},\overline{DF}\perp\overline{BC}$	Given
Angles ABC, EBC, BCF & BCD are all right angles	Perpendicular lines create right angles
$\angle ABC\cong\angle EBC\cong\angle BCF\cong\angle BCD$	All right angles are congruent
$\overline{AB}\ \mathrm{P}\ \overline{DC}$	Congruent alternate interior angles create parallel lines

11)

Statements	Reasons
$\overline{AC}\ \mathrm{P}\ \overline{DF}$	Given
$\angle A\cong\angle F,\angle C\cong\angle D$	If 2 lines are parallel then alternate interior angles are congruent
E is the midpoint of $\overline{AF}$	Given
$\overline{AE}\cong\overline{EF}$	Definition of a Midpoint
$\Delta ACE\cong\Delta FDE$	AAS
$\overline{DE}\cong\overline{CE}$	CPCTC

12)

Statements	Reasons
ΔABC with altitudes $\overline{BD}$ and $\overline{CE}$	Given
$\overline{AC}\perp\overline{BD},\overline{AB}\perp\overline{CE}$	Definition of an altitude
Angles BEC & CDB are both right angles	Perpendicular lines form right angles
$\angle BEC\cong\angle CDB$	All right angles are congruent
$\overline{BC}\cong\overline{BC}$	Reflexive
$\angle ABC\cong\angle ACB$	Given
$\Delta BEC\cong\Delta CDB$	AAS
$\overline{CD}\cong\overline{BE}$	CPCTC
$\overline{AD}\cong\overline{CD}$	Given
$\overline{AD}\cong\overline{BE}$	Transitive

13)

Statements	Reasons
ΔABC , $\overline{BD}$ is an altitude, $\overline{AD}\cong\overline{CD}$	Given
$\overline{AC}\perp\overline{BD}$	Definition of an altitude
Angles ADB & CDB are both right angles	Perpendicular lines form right angles
$\angle ADB\cong\angle CDB$	All right angles are congruent

$\overline{BD} \cong \overline{BD}$	Reflexive
$\Delta ADB \cong \Delta CDB$	SAS
$\overline{AB} \cong \overline{CB}$	CPCTC

14)

Statements	Reasons
ΔABC with point E is between A and C	Given
ΔABC with point D is between C and E	Given
$\overline{AE} + \overline{ED} \cong \overline{AD}$ and $\overline{CD} + \overline{ED} \cong \overline{CE}$	Segment Addition Postulate
$\overline{AE} \cong \overline{CD}$	Given
$\overline{CD} + \overline{ED} \cong \overline{AD}$ and $\overline{CD} + \overline{ED} \cong \overline{CE}$	Substitution
$\overline{AD} \cong \overline{CE}$	Transitive
$\angle ABE + \angle EBD \cong \angle ABD, \angle CBD + \angle EBD \cong \angle CBE$	Angle Addition Postulate
$\angle ABE \cong \angle CBD$	Given
$\angle CBD + \angle EBD \cong \angle ABD, \angle CBD + \angle EBD \cong \angle CBE$	Substitution
$\angle ABD \cong \angle CBE$	Transitive
$\angle A \cong \angle C$	Given
$\Delta ABD \cong \Delta CBE$	AAS
$\angle BEC \cong \angle BDA$	CPCTC

15)

Statements	Reasons
ΔABC with medians $\overline{AD}$ and $\overline{CE}$	Given
Point D is the midpoint of $\overline{BC}$	Definition of a median
Point E is the midpoint of $\overline{AB}$	Definition of a median
$\overline{BD} \cong \overline{CD}$ and $\overline{AE} \cong \overline{EB}$	Definition of a midpoint
$\overline{AE} + \overline{EB} \cong \overline{AB}$ and $\overline{CD} + \overline{BD} \cong \overline{CB}$	Segment Addition Postulate
$\overline{EB} + \overline{EB} \cong \overline{AB}$ and $\overline{BD} + \overline{BD} \cong \overline{CB}$	Substitution
$\overline{EB} \cong \overline{BD}$	Given
$\overline{BD} + \overline{BD} \cong \overline{AB}$ and $\overline{BD} + \overline{BD} \cong \overline{CB}$	Substitution
$\overline{AB} \cong \overline{CB}$	Transitive
$\angle B \cong \angle B$	Reflexive
$\Delta EBC \cong \Delta DBA$	SAS
$\overline{CE} \cong \overline{AD}$	CPCTC

16)

Statements	Reasons
$\angle HBI \cong \angle CBD$	Given
$\overline{DB}\ \mathrm{P}\ \overline{AE}$	Given
$\angle GAF \cong \angle ABD$	If 2 lines are parallel then corresponding angles are congruent
Angles HBI and ABD are vertical	Definition of vertical angles
$\angle HBI \cong \angle ABD$	Vertical angles are congruent
$\angle GAF \cong \angle HBI$	Transitive
$\angle GAF \cong \angle CBD$	Transitive

$\angle AEB \cong \angle CBD$	If 2 lines are parallel then corresponding angles are congruent
$\angle GAF \cong \angle AEB$	Transitive
Angles AEB and KEJ are vertical	Definition of vertical angles
$\angle AEB \cong \angle KEJ$	Vertical angles are congruent
$\angle GAF \cong \angle KEJ$	Transitive

17)

Statements	Reasons
$\overline{BC} \cong \overline{DC}$, $\overline{CI} \cong \overline{CH}$	Given
Angles BCI and DCH are vertical	Definition of vertical angles
$\angle BCI \cong \angle DCH$	Vertical angles are congruent
$\Delta BCI \cong \Delta DCH$	SAS
$\overline{BI} \cong \overline{DH}$	CPCTC
ΔABC with altitude $\overline{BI}$	Given
ΔFCH with altitude $\overline{DH}$	Given
$\overline{AC} \perp \overline{BI}$, $\overline{FC} \perp \overline{DH}$	Definition of an altitude
Angles ABI & FDH are both right angles	Perpendicular lines form right angles
$\angle ABI \cong \angle FDH$	All right angles are congruent
$\angle AIB \cong \angle FHD$	Given
$\Delta ABI \cong \Delta FDH$	ASA
$\overline{AI} \cong \overline{FD}$	CPCTC

18)

Statements	Reasons
$\angle ABD \cong \angle CBE$	Given
$\angle ABD + \angle BCE \cong \angle ABE, \angle CBE + \angle BCE \cong \angle CBD$	Angle addition postulate
$\angle CBE + \angle BCE \cong \angle ABE, \angle CBE + \angle BCE \cong \angle CBD$	Substitution
$\angle ABE \cong \angle CBD$	Transitive
$\overline{BE}$ is a bisector of $\overline{AC}$	Given
Point B is the midpoint of $\overline{AC}$	Definition of a segment bisector
$\overline{AB} \cong \overline{CB}$	Definition of a midpoint
$\angle A \cong \angle C$	Given
$\Delta ABE \cong \Delta CBD$	ASA
$\overline{BD} \cong \overline{BE}$	CPCTC

19)

Statements	Reasons
ΔACB with median $\overline{CE}$	Given
Point E is the midpoint of $\overline{AB}$	Definition of a median
$\overline{AE} \cong \overline{BE}$	Definition of a midpoint
ΔACB with altitude $\overline{CE}$	Given
$\overline{CD} \perp \overline{AB}$	Definition of an altitude
Angles AED & BED are both right angles	Perpendicular lines form right angles

$\angle AED \cong \angle BED$	All right angles are congruent
$\overline{ED} \cong \overline{ED}$	Reflexive
$\Delta AED \cong \Delta BED$	SAS
$\overline{AD} \cong \overline{BD}$	CPCTC

20)

Statements	Reasons
Circle C with points A and B both being on the circle	Given
$\overline{CB}$ and $\overline{CA}$ are radii of circle C	Definition of a radius
$\overline{CB} \cong \overline{CA}$	In a circle, all radii are congruent
$\overline{CD}$ bisects $\angle BCA$	Given
$\angle BCD \cong \angle ACD$	Definition of an angle bisector
$\overline{CD} \cong \overline{CD}$	Reflexive
$\Delta BCD \cong \Delta ACD$	SAS
$\angle BDC \cong \angle ADC$	CPCTC