Geometry Homework #19 – Answer Key
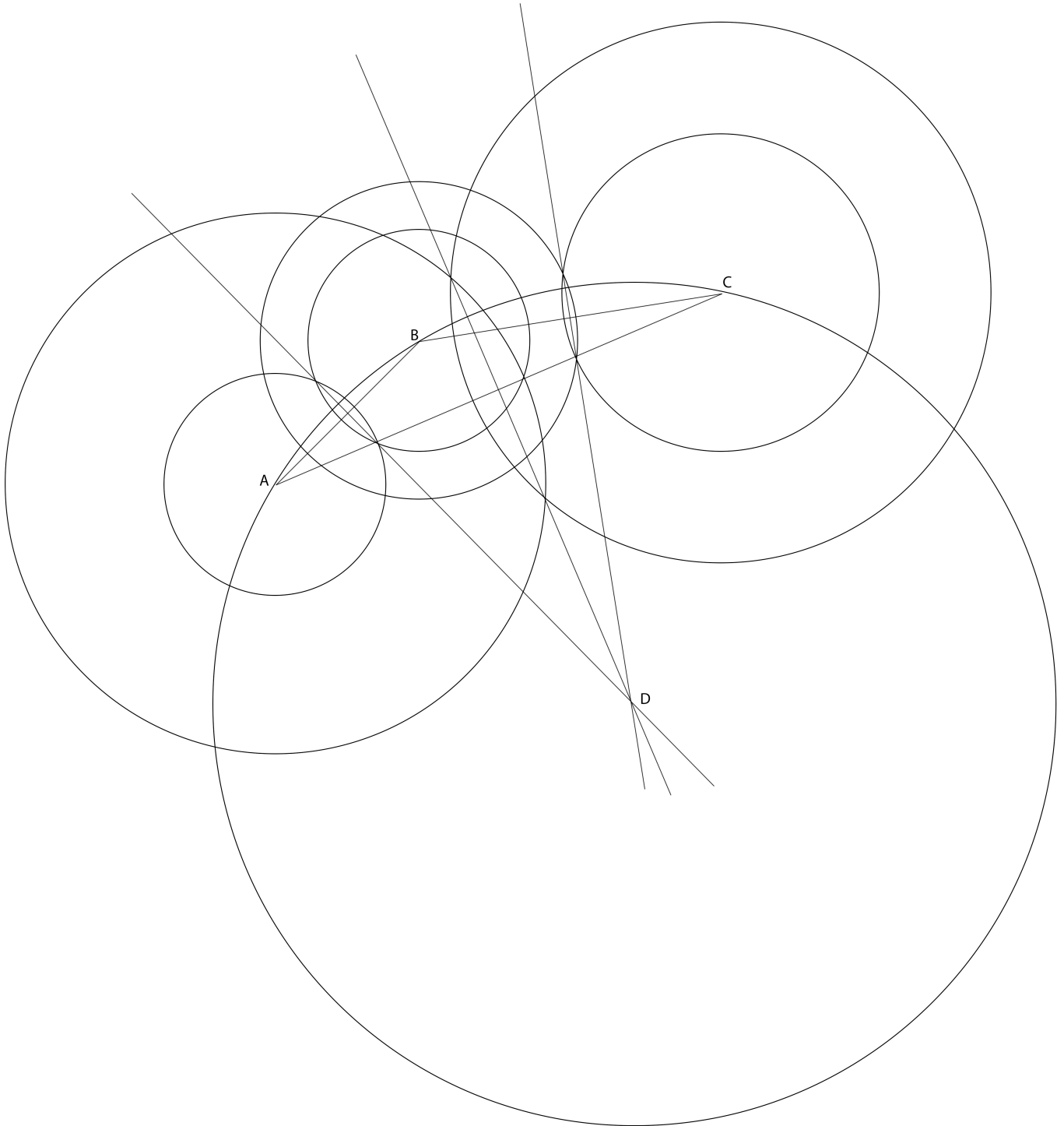
1) $(x-4)^2 + (y+7)^2 = 121$

2) $\dfrac{(x+2)^2}{16} + \dfrac{(y+5)^2}{81} = 1$

3) Your construction should resemble with intersection of the bisectors being D which is the center of the circle circumscribed about triangle ABC

4) Radius $= 7$ and the center is $(9,4)$
5) Minor axis $= 16$, major axis $= 20$, and the center is $(2,-3)$
6) It has consistency because none of the premises contradict each other. It has validity because a parallelogram is always a quadrilateral with opposite sides parallel. It has soundness because it has validity and the premise is actually true as a parallelogram is always a quadrilateral. It has completeness because if you exchange the premises with the conclusion, the argument still exhibits soundness. If a quadrilateral has opposite parallel sides, then it must be a parallelogram.
7) It is a deductive argument because the conclusion was not determined from an inference (educated guess) based on an observed pattern. It has consistency because none of the premises contradict each other. Birds being frogs doesn't preclude frogs from being elephants. It has validity because if all birds are frogs, which they aren't and if all frogs are elephants, which they aren't, then the conclusion that all birds are elephants would be true based on the structure of the premises. It does not have soundness because neither premise is actually true. It also does not have completeness because, if you reversed the argument, it wouldn't be sound.
8) Abigail got the book, Jacob got the cake, Chloe got the hat, Derrick got the fruit and Andrew got the music CD.
9) It has consistency because none of the premises contradict each other. It does not have validity because even if Andrew is a boy and Chloe is a girl, that doesn't mean that Abigail would have to be a fish. It does not have soundness because it doesn't have validity. It does not have completeness because if you exchange the premises with the conclusion, the argument does not exhibit soundness because it is not valid. Even though both conclusions, Andrew is a boy and Chloe is a girl, are true, neither conclusion is true because Abigail is a fish.
10) 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 24, it could be the days of the month in February and March starting with the 24th of February, assuming it isn't a leap year. This means that the next number in the sequence would be 1.
11) Jacob bought the technology stock, Chloe bought the oil stock, Derrick bought the utility stock, and Abigail bought the automotive stock.
12) It has consistency because none of the premises contradict each other. It has validity because a regular hexagonal figure is always a closed figure with six sides. It has soundness because it has validity and the premise is actually true, figures can be regular hexagons. It does not have completeness because if you exchange the premises with the conclusion, the argument does not exhibit soundness because it wouldn't be valid. If a closed figure has six sides, it does not have to be a regular hexagon. It could be just a hexagon.
13) It is an inductive argument because the conclusion can only be based on inference (educated guess) based on an observed pattern. If x is zero, then y is 11. If x is one, then y is 11. If x is two, then y is 13, if x is three, then y is 17. If x is four, then y is 23. If x is five, then y is 31. If x is six, then y is 41. If x is seven, then y is 53. If x is eight, then y is

67. If x is nine, then y is 83. If x is ten, then y is 101. Based on this pattern, all of the y's are prime numbers. But, if x is eleven, then y is 121 which is NOT prime.

14) Derek won the introductory algebra contest, Abigail won the Geometry contest, Andrew won the intermediate algebra contest, and Chloe won the basic math contest.

15) It has consistency because none of the premises contradict each other. It does not have validity because even if cows are animals, which they are, and goats are animal, which they are, that doesn't imply that cows are goats, which they are not. It does not have soundness because it doesn't have validity. It does not have completeness because, if you exchange the premises with the conclusion, the argument does not exhibit soundness even though reversing the argument makes it valid. Reversing the argument makes the premise false since cows are not goats.

16) It could be either an inductive or deductive argument depending on how you approach the analysis of the argument. If you tried to answer the question by substituting values for x and testing to see if each answer actually made $\dfrac{x^2 - 36}{x+6} = x - 6$, then you used inductive reasoning. A counter example, using inductive reasoning, would be $x = -6$ since left side becomes undefined while the right side equals negative twelve. If you used algebraic rules to determine the answer, then you used deductive reasoning. If you allow x to be any real number, factor the numerator, $x^2 - 36 = (x+6)(x-6)$, write down your restrictions, $x \neq -6$, and reduce the left side to get $x - 6 = x - 6$, then $\dfrac{x^2 - 36}{x+6} = x - 6$. It does not have consistency because the premise that x can be any real number and the premise that $x \neq -6$ contradict each other. It does not have validity because you can't find an example that complies with all the premises because it's not consistent. It does not have soundness because it is not valid. It also does not have completeness because, if you reversed the argument, it wouldn't be sound. The reverse argument is not valid because the premise would not guarantee all of the conclusions.

17) Atlanta hosted the stamp collecting conference, Chicago hosted the baseball card collecting conference, Philadelphia hosted the coin collecting conference, and San Diego hosted the comic book collecting convention.

18) It does not have consistency because the premise that on Tuesdays you always go to the bank and the premise that you never leave the house on days that start with the letter T contradict each other. It does not have validity because you can't find an example that complies with all of the premises because it's not consistent. It does not have soundness because it doesn't have validity. It does not have completeness because if you exchange the premises with the conclusion, the argument does not exhibit soundness because it is not valid. In the reverse argument, even if the premise is true, it does guarantee any of the conclusions.

19) It could be either an inductive or deductive argument depending on how you approach the analysis of the argument. If you tried to answer the question by substituting values for x and testing to see if each answer actually produced an answer of five, then you used inductive reasoning. The issue with trying to invoke inductive reasoning is that it is impossible to find a counter example, because the argument is always true. You also can't

prove that it is always true using inductive reasoning because it's impossible to try every real number. If you used algebraic rules to determine the answer, then you used deductive reasoning. If you allow x to be any real number, add four to this number, $x + 4$, multiply that sum by three, $3(x + 4)$, subtract seven from that product, $3(x + 4) - 7$, decreasing this amount by triple the original number, $3(x + 4) - 7 - 3x$, use the order of operations to simplify this result, then you get five. It has consistency because none of the premises contradict each other. It has validity because, if you comply with all of the premises, the answer must always be five. It has soundness because it has validity and all of the premises are really true. It does not have completeness because, if you reversed the argument, it wouldn't be sound because the reverse is not valid due to the fact that the premise of the answer being five would not guarantee any of the conclusions.

20) The full names are Barb Lee, Sam Smith, Joe Jones, and Dan Gonzales.