Name: **Key** Date: _____ Period: _____

6.2 Bisectors of Triangles CYU

CONCEPTS	BASIC	INTERMEDIATE	ADVANCED
Properties of Perpendicular Bisectors	1	2	
Properties of Angle Bisectors	3	4	
Locating the circumcenter given vertices		12	5 – 7
Incenter properties of a triangle	8, 9	10	11, 13
Drawing special segments		12	13
Drawing a circumscribed circle about a triangle			12
Sometimes, Always, or Never			14 - 17

The perpendicular bisectors of ΔABC intersect at point G and are shown in blue. Find the indicated measure.

1. Find BG. **= 9**
   Blue: DG, GF, GE
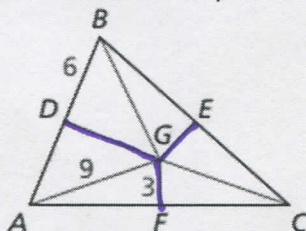
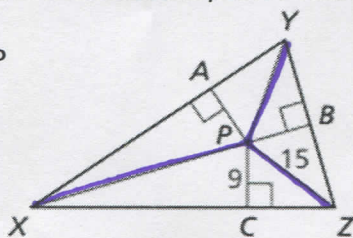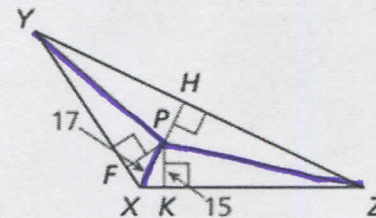2. Find GA. **= 11**
   Blue: GE, GD, GF
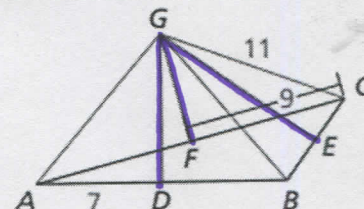
The angle bisectors of ΔXYZ intersect at point P and are shown in red. Find the indicated measure.

3. Find PB **= 9**
   Red: PY, ZP, XP

4. Find HP. **= 15**
   Red: PY, ZP, XP

Find the coordinates of the circumcenter of the triangle with the given vertices.

5. A(2, 6), B(8, 6), C(8, 10)

   (5, 8)

6. D(- 7, - 1), E(- 1, - 1), F(- 7, - 9)

   (-4, -5)

7. H(- 10, 7), J(- 6, 3, L(- 2, 3)

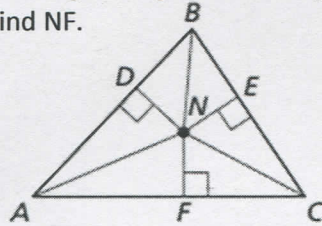   **(-4, 9)**

N is the incenter of ΔABC. Use the given information to find the indicated measure.
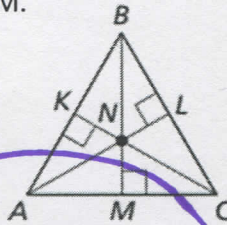
8. ND = 6x − 2, NE = 3x + 7, Find NF.

NF = 16

9. NG = x + 3, NH = 2x − 3, Find NJ.

NJ = 9
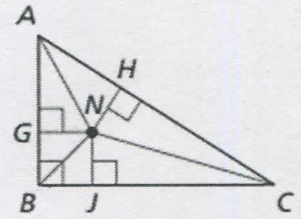
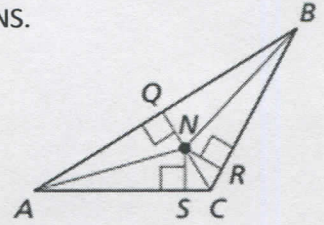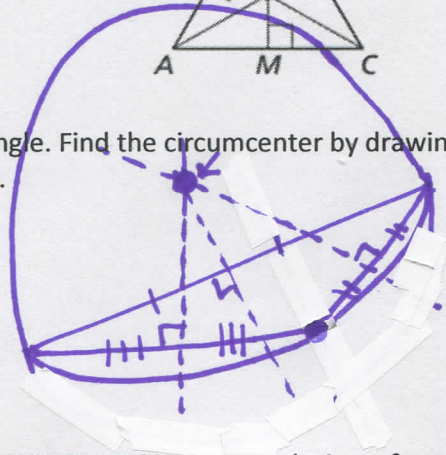10. NK = 2x − 2, NL = − x + 10, Find NM.

**NM = 6**

11. NQ = 2x, NR = 3x − 2, Find NS.

NS = 4

12. Draw an obtuse triangle. Find the circumcenter by drawing the three special segments. Then draw the circumscribed circle.
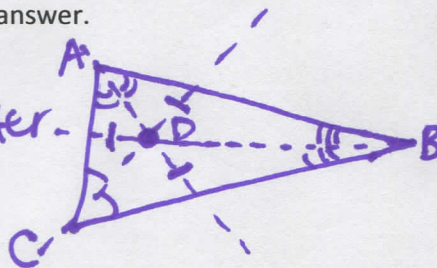

13. **MODELING WITH MATHEMATICS:** You are placing a fountain in a triangular koi pond, like at the Potosi Brewery. You want the fountain to be the same distance from each edge of the pond. Where should you place the fountain? Explain your reasoning. Use a sketch to support your answer.
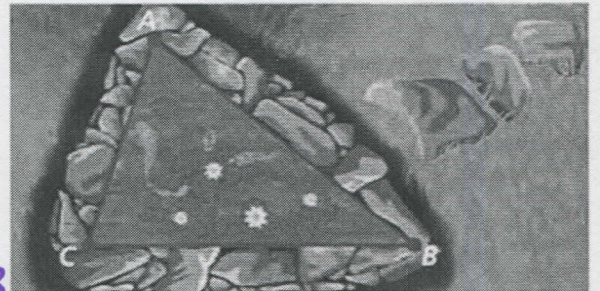
Incenter Thm

D is the incenter.

SOMETIMES, ALWAYS, or NEVER. Provide a counterexample if the answer is not always.

14. The circumcenter of a scalene triangle is **S** inside the triangle. **counterexamples may vary**

15. If the perpendicular bisector of one side of a triangle intersects the opposite vertex, then the triangle is **A** isosceles. **no counterexample**

16. The perpendicular bisectors of a triangle intersect at a point that is **S** equidistant from the midpoints of the sides of the triangle. **counterexamples may vary**

17. The angle bisectors of a triangle intersect at a point that is **A** equidistant from the sides of the triangle. **no counterexam**

CYU Reflection: *How far can you go: basic, intermediate, or advanced?*
Rate your mastery level!
How confident are you with the skills this CYU covered? Circle the score you would give yours elf.

1	2	3	4	5	6	7	8
Basic		Intermediate			Advanced		Solved ALL!