

## GEOMETRY POINTS OF CONCURENCY PROJECT

Using a compass and straight edge (ruler) you will construct the angle bisectors, perpendicular bisectors, altitudes, and medians for 4 different triangles; a Right Triangle, Isosceles Triangle, Scalene Triangle, and an Equilateral Triangle. The purpose of this project is for you to have a better understanding of the properties of each of these constructions as well as the location of the points of concurrency.

### Project Directions

1. You will need four triangles one large triangle for each classification A Right  $\Delta$  (that is NOT isosceles) Isosceles  $\Delta$  (that is not a right triangle), Scalene  $\Delta$  (that is not a right triangle), and an equilateral  $\Delta$ , in which you are to make all 4 compass constructions (perpendicular bisector, median, altitude, and angle bisectors in each of the 4 triangles
2. Triangles if needed can be found at my website: <http://natasha.paunovska.com/subjects/geometry/>
  - Go to Geometry
  - Choose 3.7
  - Choose All 4 Triangles

*The file is a PDF, so it will open on all computers. Also each template includes a section for the description, and a key to color code the compass constructions.*

3. Construct the 3 medians, 3 altitudes, 3 perpendicular bisectors, and 3 angle bisector for **each** type of triangle
4. All construction marks should be left on the paper.
5. Use the provided key to identify each construction (ex. angle bisectors - red, perpendicular bisectors - blue, etc.)
6. All Points of concurrency **clearly marked and labeled**. (for each triangle)
7. **All** congruent segments and congruent angles should be clearly marked as well as any right angles.
8. For **each** triangle, in **complete sentences**: (to be hand written in the "Description" section of the template)
  - Name and classify the triangle by **angles** and **sides**,
  - Name the points of concurrency of the medians, altitudes, perpendicular bisectors, and angle bisectors for each triangle
  - Describe the location of the intersection (inside, on, or outside the triangle)
9. Project should be in some type of folder and have a cover page with Name, Date, Period, and **attach the given rubric**.
10. Project should be neat, accurate, and organized. All lines should be drawn with a ruler, and the vertices of the triangles should be labeled.
11. Once project is completed answer the following questions: (**write answers on attached rubric sheet**)
  - a) The angles bisector of a triangle is (**sometimes, always, or never**) the perpendicular bisector.
  - b) The median of the triangle is (**sometimes, always, or never**) the perpendicular bisector.
  - c) The altitude of the triangle is (**sometimes, always, or never**) the perpendicular bisector.
  - d) The centriod of a triangle is (**sometimes, always, or never**) the circumcenter of the triangle.

- e) The altitude from the vertex angle of an isosceles triangle is (*sometime, always, or never*) the median.
- f) The median of any side of an equilateral triangle is (*sometimes, always, or never*) the angle bisector.
- g) The altitude of a triangle is (*sometime, always, or never*) the angle bisector of a triangle
- h) The incenter of a triangle is (*sometime, always, or never*) the centroid of a triangle.

12. Each student will be given a set of compass and ruler directions for the constructions. Additional links and videos are available on my website.

**DUE DATE: \_\_\_\_\_**

**\*\*\*LATE PROJECTS WILL NOT BE ACCEPTED\*\*\***

Failure to complete this project may result in the failure of the quarter. Additional help is available after school @ 1128

*Extra Credit: go to the following website <http://hptgn.tripod.com/> and on the left side of the page select one of the following compass and straightedge constructions. Each construction is given a possible number of points extra credit for the construction (only one may be constructed for extra credit)*

Construction	Points Possible
Triangle	3
Square	3
Pentagon	5
Hexagon	5
Heptagon	6
Octagon	7
Nonagon	8
Decagon	9
Pentadecagon	10
Heptadecagon	10

*PLEASE TEAR OFF THE SECTION BELOW AND RETURN TOMORROW*

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*I have read the directions, noted the due date, and understand that NO projects will be accepted after the due date \_\_\_\_\_.*

*Student Signature: \_\_\_\_\_ Date: \_\_\_\_\_*

*My child has informed me of the upcoming project in his/her Geometry class.*

*Parent/Guardian Signature: \_\_\_\_\_ Date: \_\_\_\_\_*

## GEOMETRY TRIANGLE CONSTRUCTION PROJECT RUBRIC

### Constructions

	Three constructions are correct 3	Two constructions are correct 2	One construction is correct 1	Non of the constructions are correct 0	SCORE
<b>Right Triangle</b>					
⊥ Bisector					
∠ Bisector					
Median					
Altitude					
<b>Acute Triangle</b>					
⊥ Bisector					
∠ Bisector					
Median					
Altitude					
<b>Obtuse Triangle</b>					
⊥ Bisector					
∠ Bisector					
Median					
Altitude					
<b>Equilateral Triangle</b>					
⊥ Bisector					
∠ Bisector					
Median					
Altitude					
				<b>TOTAL</b>	

### Intersections

	Four intersections are correctly drawn 4	Three intersections are correctly drawn 3	Two intersections are correctly drawn 2	One intersection is correctly drawn 1	No intersection is correctly drawn 0	SCORE
Right Triangle						
Acute Triangle						
Obtuse Triangle						
Equilateral Triangle						
					<b>TOTAL</b>	

**Descriptions**

	None of the following are given: (The triangle is correctly classified, the location of the intersection is given, and the intersection is correctly named)	0	1	2	3	SCORE
Right Triangle						
Acute Triangle						
Obtuse Triangle						
Equilateral Triangle						
						<b>TOTAL</b>

**Notation/Organization/Neatness**

	Lines are not drawn with a ruler, a key is not included for each triangle, all points are not labeled, ALL congruent angles and segments are not marked	0	1	2	3	4	SCORE
Right Triangle							
Acute Triangle							
Obtuse Triangle							
Equilateral Triangle							
							<b>TOTAL</b>

**QUESTIONS:**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_

Questions SCORE: \_\_\_\_\_

**PROJECT TOTAL: \_\_\_\_\_ /100**