**Geometry Stained Glass Project *WITH HINTS*** Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Collaboratively the Geometry classes will be replicating stained glass cathedral windows. The window designs will consist of the properties of circles that you have studied thus far. You will be responsible for one ‘pane’ of glass that will consist of a circle on the paper attached.*

***First create a draft of your design to ensure the required elements below will fit, be organized, and look beautiful!***

***REQUIRED ELEMENTS IN YOUR DESIGN***

1. Use these 4 properties of circles in your design (where possible, use constructions to create the properties):

1. 2 chords showing the exact center of the circle (construction of the center of the circle)

Hint: Create 2 chords in a “v” so that the chords share one point. This will give you three points on the circle. Use your compass to find the center.

1. A sector of the circle with it’s area and arc length calculated below (you may use a protractor to measure your central angle)

Hint: The radius of the circle is 8 cm. Use the protractor to measure the central angle then use the Sector Area and Arc Length formulas to calculate the solutions.

|  |  |
| --- | --- |
| Sector Area Calculations (use $cm$ as units) Sector Area (with pi and $cm^{2}$) : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Arc Length Calculations (use $cm$ as units)Arc Length (with pi and $cm$): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

1. 2 Inscribed Angles that share the same arc

Hint: Inscribed angles are angles where the vertex is on the circle. Chose an inscribed angle that you have already drawn. Make a new vertex on the circle then draw in chords so the original inscribed angle and the new angle both have the same arc.

1. A small circle (on the interior of your circle) with ***two secant lines*** that are ***inscribed angles*** of the big circle.

Hint: Draw a smaller circle inside your circle that goes through the sides of your inscribed angle from letter c.

3. Outline the major constructions and lines in your design with a thick black marker to simulate lead lines.

 You do not need to copy the construction marks from your draft onto the final copy.

**Final Score:**

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| --- | --- | --- |
| ***Properties Used*** | ***Creativity*** | ***Neatness*** |
| All 4 properties applied correctly(8 pts.) | E.C. +2 |  |
| 3 of 4 properties applied correctly(6 pts.) | E.C. +1 |  |
| 2 of 4 properties applied correctly (4 pts.) | Color used appropriately (2 pt.) | Properties easy to identify and find (2 pt.) |
| 1 of 4 properties applied correctly(2 pts.) | Some Color used(1 pt.) | Some properties easy to identify and find (1 pt.) |