

# Locating the Center Of a Circle

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**Theorem G.** Given the circumference of a circle, we can find the center of the circle in five strokes.

Step 1: Choose any three different points on the given circle: A, B and C. Construct circle A through point C.

Step 2: Construct circle C through point A. Note the two points where they intersect.

Step 3: Draw line  $\ell$  through the intersections of circle AC and circle CA.

Step 4: Construct circle B through A. Note the two points where the circles intersect.

Step 5: Draw line  $m$  through the intersections of circle AB and circle BA. Note where line  $\ell$  and line  $m$  intersect. This is the center of the circle.

*Proof.* Note that points A and B when connected are a chord of our original circle ABC. Also, connecting the points where circle AB and circle BA intersect is our construction of a perpendicular line. Together this makes a line perpendicular to the chord of a circle, which passes through the center by Euclid III.1 porism. Following the same procedure with circle AB and Circle BA results in two different lines that pass through the center of the circle. Since two line can only intersect once, they must intersect at the center of our circle.

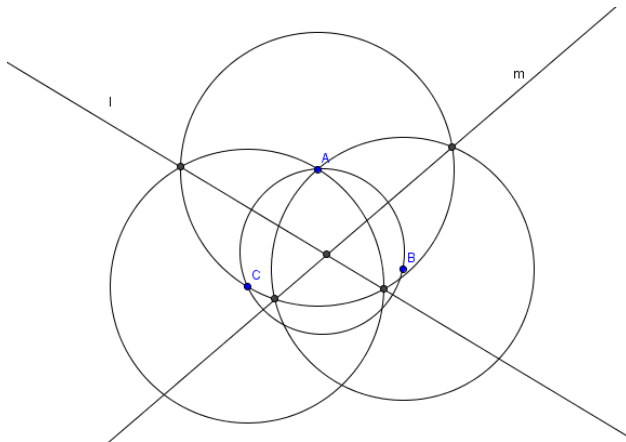


Figure 1:

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Refereed by Mr. Austin Henry and Ms. Ange Rhenstrom