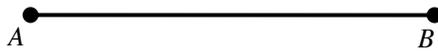


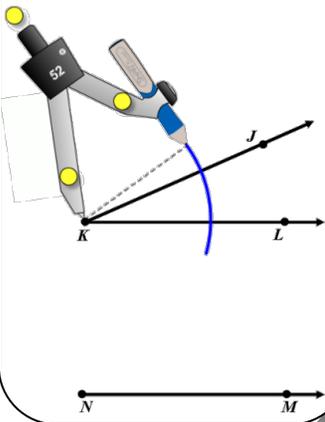
1. **[COPY SEGMENT]** Construct a segment with an endpoint of C and congruent to the segment AB.  
(Pg 57 in SSG)



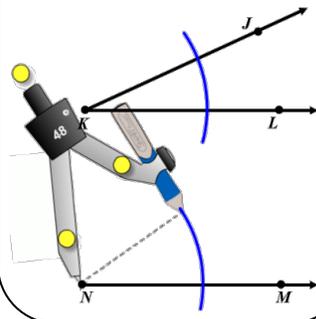
**\*\*Using a ruler measure the two lengths to make sure they have the same measure.**

2. **[COPY ANGLE]** Construct an angle with ray  $\overrightarrow{HI}$  and congruent to the angle  $\angle DEF$

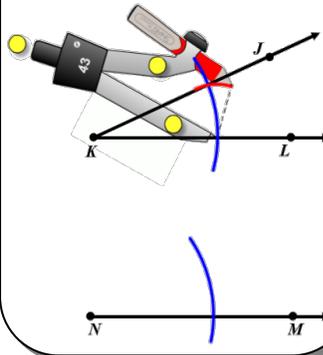
**Step 1:** Open the compass to any length and create an arc on the original angle with the needle at the vertex



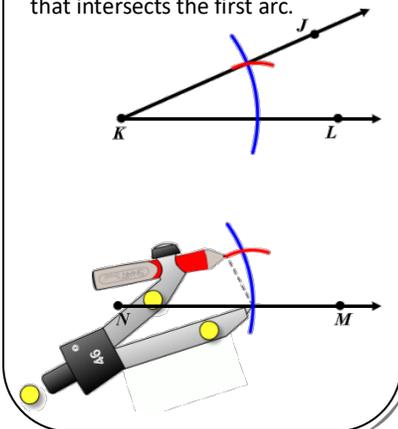
**Step 2:** Leave the compass set to the exact same length and create a new arc on the new ray with the needle at the end point of the ray.



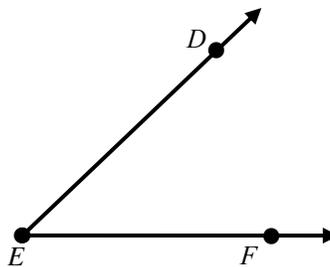
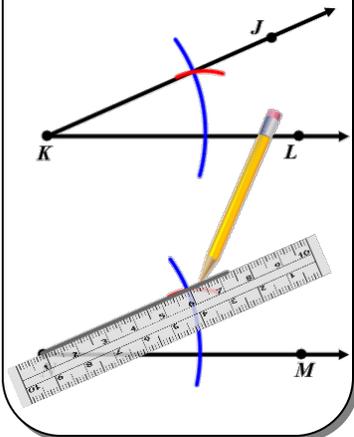
**Step 3:** Open the compass to the length of the intercepted arc in the original angle and draw a small arc to be sure the created arcs intersect on the ray of the angle.



**Step 4:** Leave the compass open to the exact same length as it was from step 3. Then with the needle at the intersection of the second arc and the copied ray, create an arc that intersects the first arc.



**Step 5:** Finally, use a straight edge to draw a ray from the endpoint of the original bottom ray through the intersection of the two created arcs.

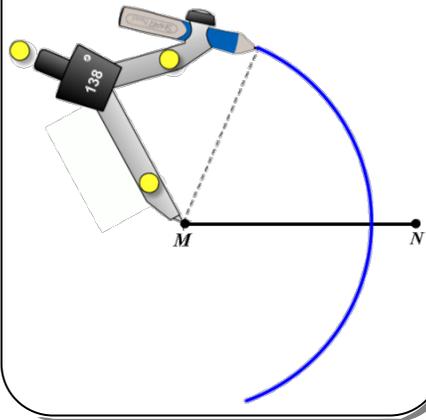


(Pg 57 in SSG)

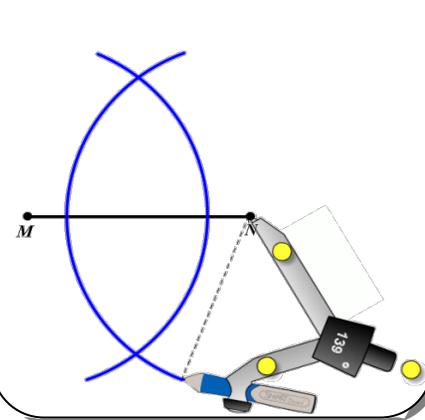
**\*\*Using a protractor measure the two angles to make sure they have the same measure.**

3. [Perpendicular Bisector] Construct a perpendicular bisector to the segment  $\overline{AB}$ .

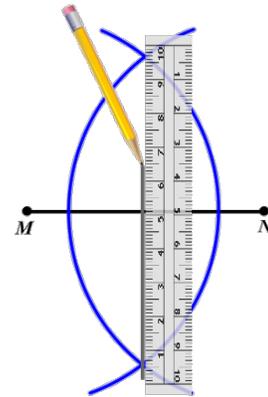
**Step 1:** Open the compass to a length that is **certainly larger than half** of the segment length. Draw an arc with the needle at the left endpoint of the segment.



**Step 2:** Leave the compass open to the same length from step 1 and create another arc only this time starting with the needle at the right endpoint.



**Step 3:** Using a straight edge and a pencil, draw a line that passes through the intersection point of the two arcs.

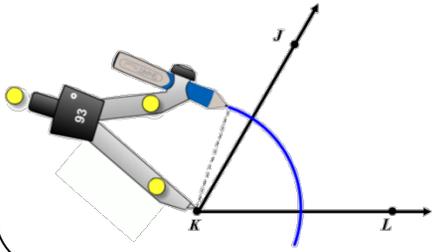


(Pg 59 in SSG)

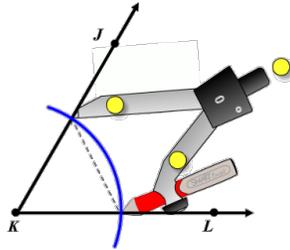
**\*\*Using a ruler measure the two halves of the segment to make sure they have the same measure.**

#### 4. [Angle Bisector] Construct an angle bisector of the angle $\angle DEF$

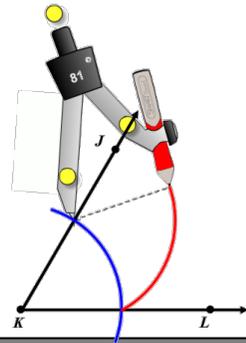
**Step 1:** Open the compass to any length and create an arc with the needle of the compass at the vertex of the angle.



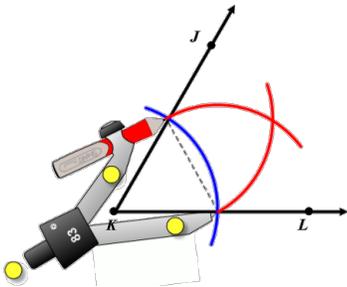
**Step 2:** Open the compass so that the needle is on one intersection of the arc and the angle and the pencil is at the other intersection of the arc and the angle.



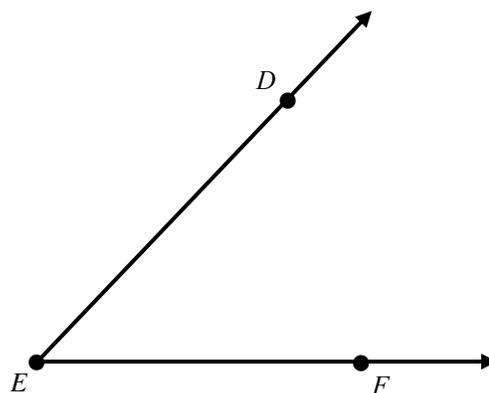
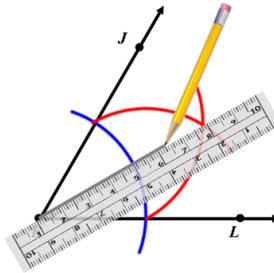
**Step 3:** Create an arc with the opened length determined in step 2 towards the interior of the angle.



**Step 4:** Move the compass so that the needle and pencil are on the opposite intersection points that they were on in step 2 and create another arc to the exterior of the angle.



**Step 5:** Using a straight edge, draw ray from the vertex of the angle through where the two outer arcs intersect.

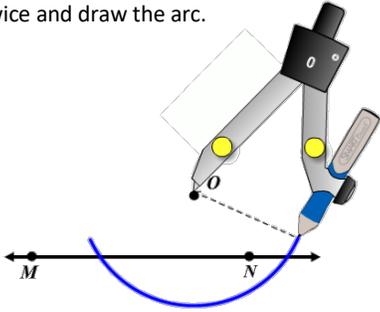


(Pg 58 in SSG)

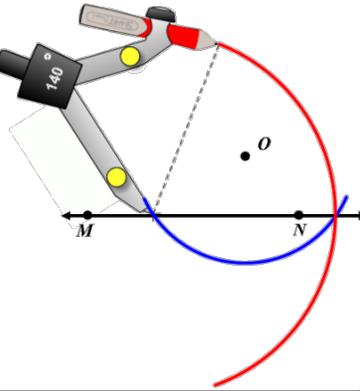
**\*\*Using a ruler measure the two halves of the segment to make sure they have the same measure.**

5. [Perpendicular to a Line Through a Point] Construct a perpendicular line to  $\overleftrightarrow{AB}$  through point C.

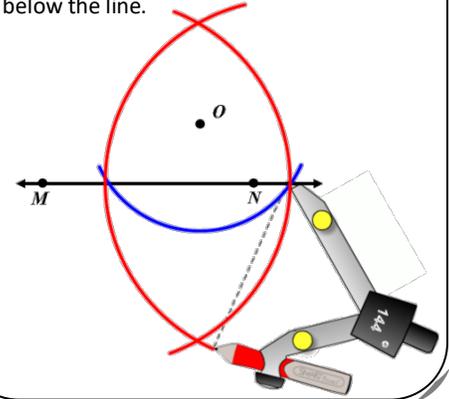
**Step 1:** Start by placing the needle on the point not on the line. Then, open your compass to a length such that when you draw an arc it will pass through the line twice and draw the arc.



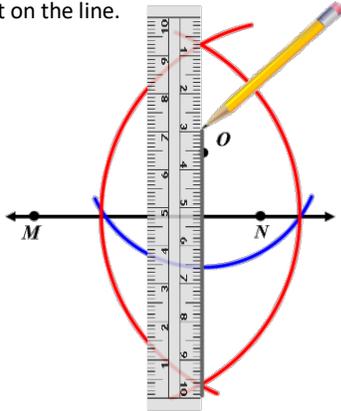
**Step 2:** Open the compass so that the needle is on one intersection of the arc and the pencil is on the other intersection of the arc. Then, create a arc above and below the line.



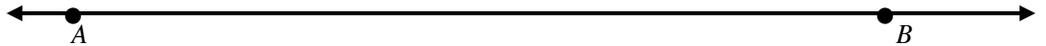
**Step 3:** Opening the compass to the same length as the previous step and switching the needle and pencil to the opposite intersections of arcs that they were on in step 2, create another arc above and below the line.



**Step 3:** Using a straight edge, draw a line passing through the intersection of the two most recent arc intersections. The line should incidentally also pass through the point not on the line.



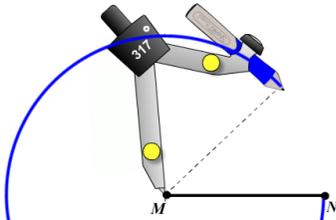
C



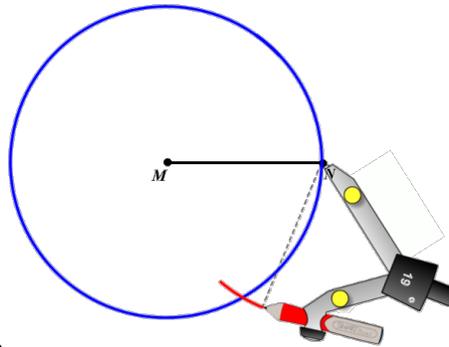
(Pg 60 in SSG)

**6. [Hexagon inscribed in a Circle] Construct a circle with radius  $\overline{AB}$  and an inscribed regular hexagon.**

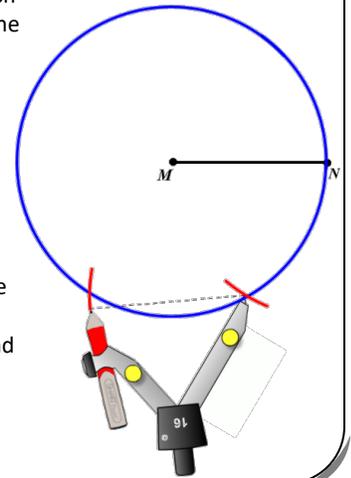
**Step 1:** Start by placing the needle on the point that is to be the center of the circle and the pencil on the other endpoint of the radius. Create the entire circle with the compass.



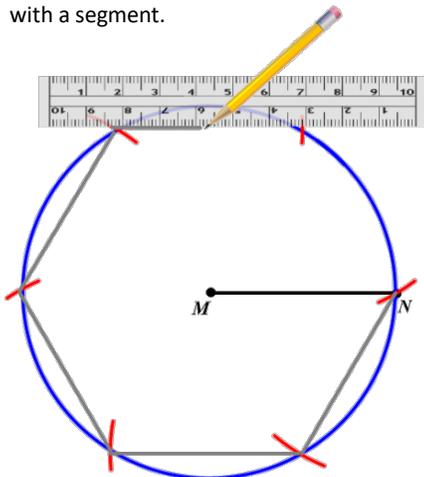
**Step 2:** With the compass still open to the exact length of the radius place the needle on the endpoint of the radius that is on the circle and with the pencil mark an intersection on the circle with a new arc.



**Step 3:** Leaving the compass still open to the same length move the needle to the new intersection point and mark another intersection point on the circle again. Continue repeating this process until you have made it all the way around the circle.



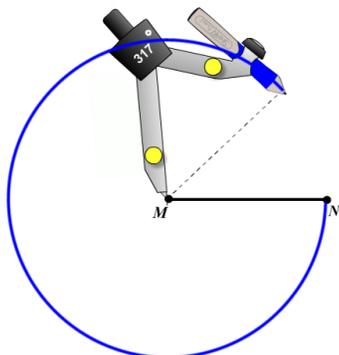
**Step 4:** The last mark should end right where you started with the needle. Then, connect each consecutive arc intersection with a segment.



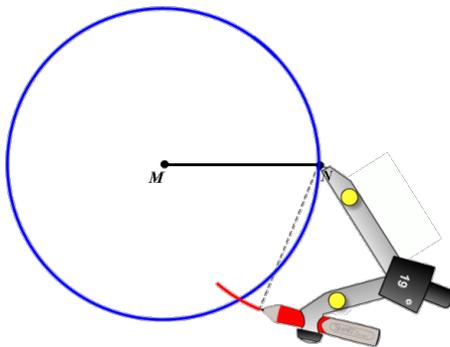
(Pg 65 in SSG)

**7. [Triangle inscribed in a Circle] Construct a circle with radius  $\overline{AB}$  and an inscribed regular triangle.**

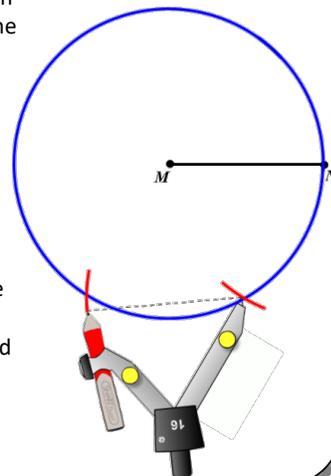
**Step 1:** Start by placing the needle on the point that is to be the center of the circle and the pencil on the other endpoint of the radius. Create the entire circle with the compass.



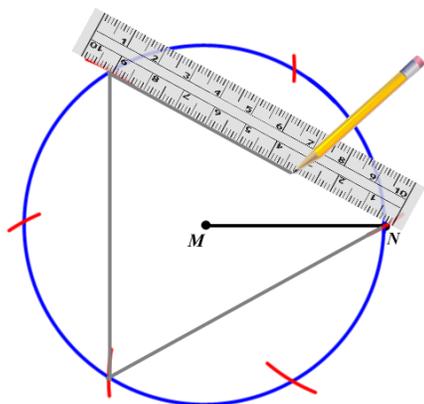
**Step 2:** With the compass still open to the exact length of the radius place the needle on the endpoint of the radius that is on the circle and with the pencil mark an intersection on the circle with a new arc.



**Step 3:** Leaving the compass still open to the same length move the needle to the new intersection point and mark another intersection point on the circle again. Continue repeating this process until you have made it all the way around the circle.

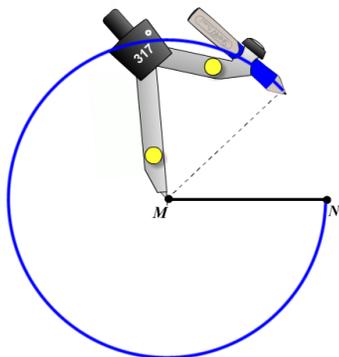


**Step 4:** The last mark should end right where you started with the needle. Then, connect every other consecutive arc intersection with a segment.

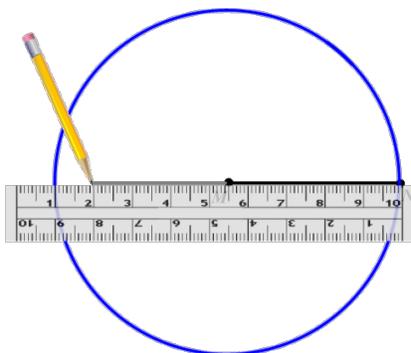


**8. [Square inscribed in a Circle] Construct a circle with radius  $\overline{AB}$  and an inscribed square.**

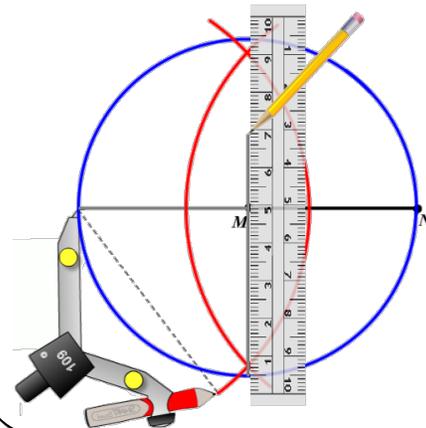
**Step 1:** Start by placing the needle on the point that is to be the center of the circle and the pencil on the other endpoint of the radius. Create the entire circle with the compass.



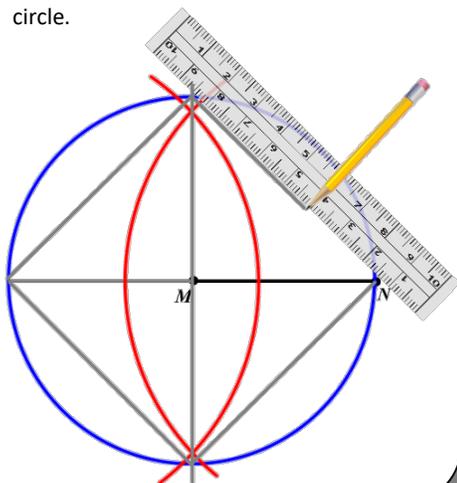
**Step 2:** Line your straight edge up with the radius and extend the radius segment to create a diameter.



**Step 3:** Create a perpendicular bisector of the newly created diameter (see previous construction #3 if needed)



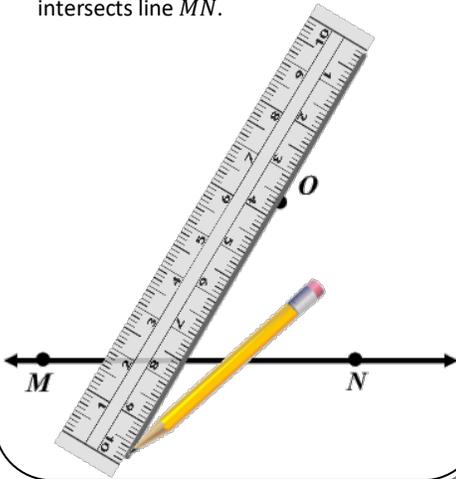
**Step 4:** Connect the each endpoint of the diameter with each endpoint of where the perpendicular bisector intersects the circle.



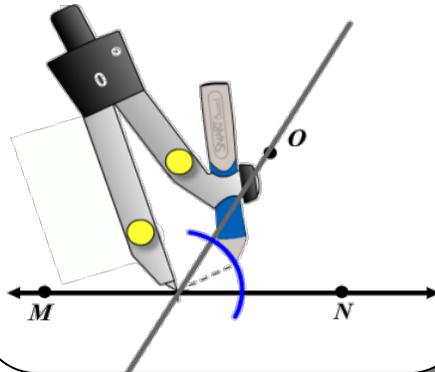
(Pg 63 in SSG)

9. [Construct a Parallel Line given a point and a line] Construct a parallel line to  $\overleftrightarrow{AB}$  through point C.

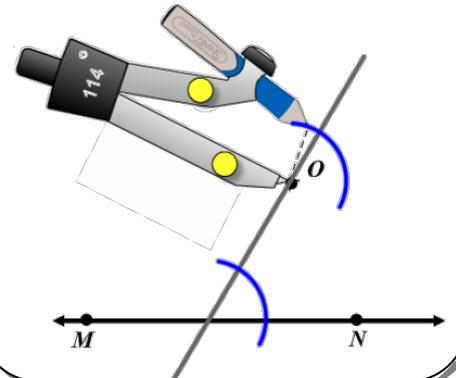
**Step 1:** Start drawing a general line that passes through point O and intersects line  $\overleftrightarrow{MN}$ .



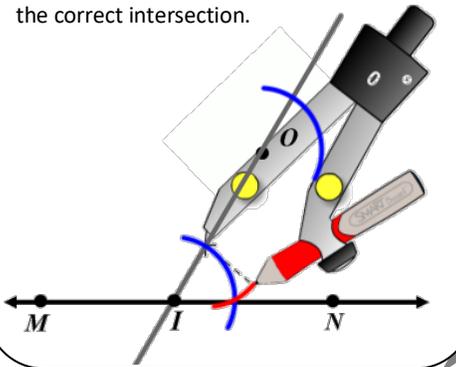
**Step 2:** Open the compass so that the needle is on the intersection of the new line just created and line  $\overleftrightarrow{MN}$ . Then, open the compass a little (it needs to be less than the distance to reach point O). Create an arc as shown below.



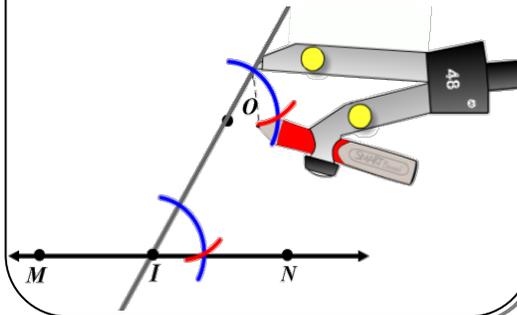
**Step 3:** Leave the compass set to the same opening and recreate another arc of the same radius but with the needle at point O.



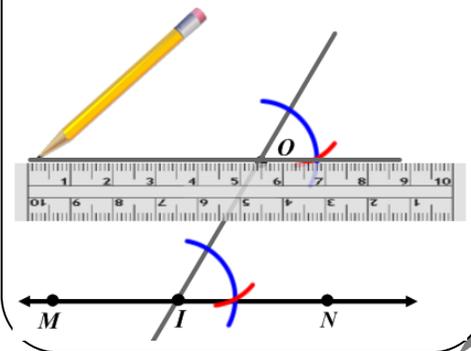
**Step 4:** Put the compass needle on the intersection of the transversal line and first arc that you created as shown below and open the pen to the intersection of the first arc and line  $\overleftrightarrow{MN}$ . Create a small arc to verify the intersection of the arcs mark the correct intersection.



**Step 5:** Leave the compass open to the same length as the previous step and put the compass needle on the intersection of the transversal line and the second arc that you created. Then, create an arc of the same radius to intersect the second arc created as shown below.



**Step 6:** D



C

A  B

(Pg 60 in SSG)