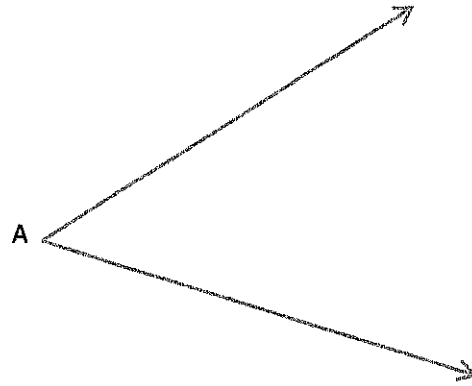


Copy an angle:

1. Place your compass on A , make any arc. Label the intersections of the arc and the sides of the angle B and C .
2. Compass on A' , make the same arc from #1. Label the intersection B' .
3. MEASURE from B to C . you will have to adjust your compass.
4. with your compass open from #3, compass on B' , make an arc. Where this arc crosses the arc from step 2 label C' . Connect A' and C' .

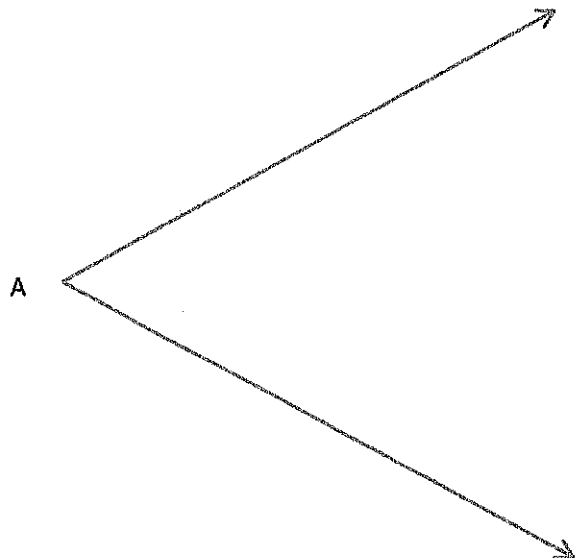
$$\angle BAS \cong \angle B'A'C'$$



Bisect an angle:

1. Compass on A , make any arc. Label where the arc crosses the sides of the angle as B and C .
2. compass on B , make an arc
3. do not change compass: compass on C make an arc
4. label where arcs intersect D

$$\angle BAD \cong \angle CAD$$



Parallel Lines:

1. Place point P above a line. Connect P to the line on some kind of angle/slant. Label the intersection of the lines Q.
2. compass on Q. Draw any arc. Label the intersection points A and B.
3. compass on P. Draw the same arc from #2. Label the intersection point C.
4. MEASURE from A to B - you will have to adjust your compass.
5. with your compass open the distance from A to B, place your compass on C and make an arc, label the intersection D.
6. connect P and D.

$$\overrightarrow{QB} \parallel \overrightarrow{PD}$$

* $\angle Q$ and $\angle P$ are congruent corresponding angles



Incenter:

These all mean the same thing:

Find the **incenter**

Find the center of the circle that is **inscribed** in a triangle

Construct the **incircle, inscribed circle**

Steps:

Construct each angle bisector of a triangle.

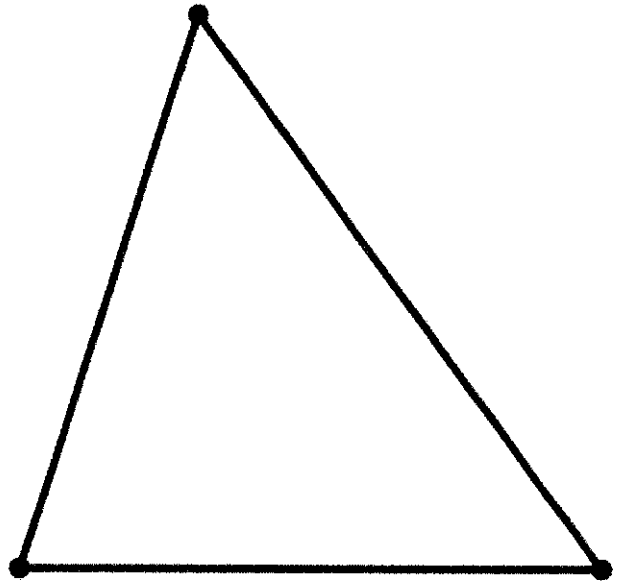
The bisectors are concurrent at the incenter.

Call the incenter C .

Construct a line perpendicular from C to one of the sides of the triangle. This will be the radius of the circle.

Compass on C , open to the length of the radius, draw a circle. It should just graze the sides of the triangle.

*the incenter is equidistant to the sides of the triangle because it is the radius of the circle.

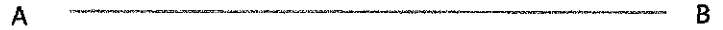


Perpendicular Bisector:

1. open compass to a little more than half the segment. Compass on A, make an arc.
2. do not change compass!! Compass on B, make an arc.
3. arcs must cross each other!! Label these points C and D. Connect C and D.
4. label the intersection of \overline{AB} and \overline{CD} E.

$$\overline{AB} \perp \overline{CD}, \overline{AE} \cong \overline{BE}$$

*also, if you place any point along the perpendicular bisector (\overline{CD}) it is equidistant to the endpoints



Perpendicular from a point to a line

1. place point P above the line
2. compass on P, make an arc so it crosses the line twice. Label these A and B.
3. widen your compass a bit. Compass on A, make an arc. Without changing compass, compass on B, make an arc.
4. label where the arcs intersect as C. Connect to P.

$$\overline{PC} \perp \overline{AB}$$



Circumcenter:

These all mean the same thing:

Find the **circumcenter**

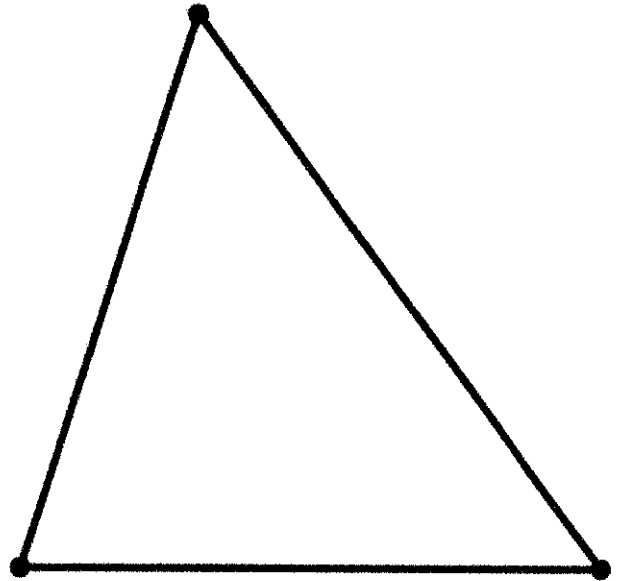
Find the **center of the circle** that you can circumscribe about a triangle

Construct the **circumcircle, circumscribed circle**

Steps:

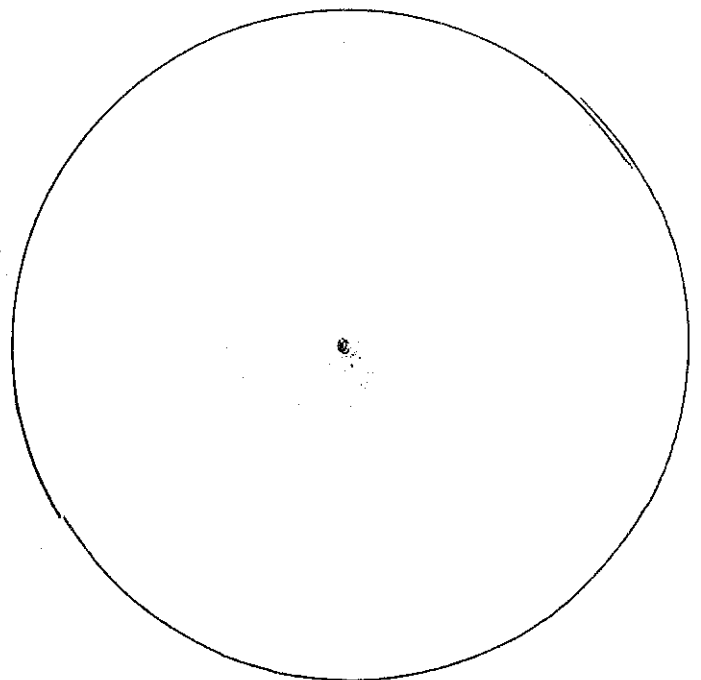
1. construct the perpendicular bisectors of each side of the triangle. These lines are concurrent at the circumcenter. Label the circumcenter C .
2. Compass on C , open it to one of the vertices (corners) of the triangle. This is the radius of your circle. Draw a circle.

***The circumcenter is equidistant to the vertices of the triangle because it is the radius of the circle.**



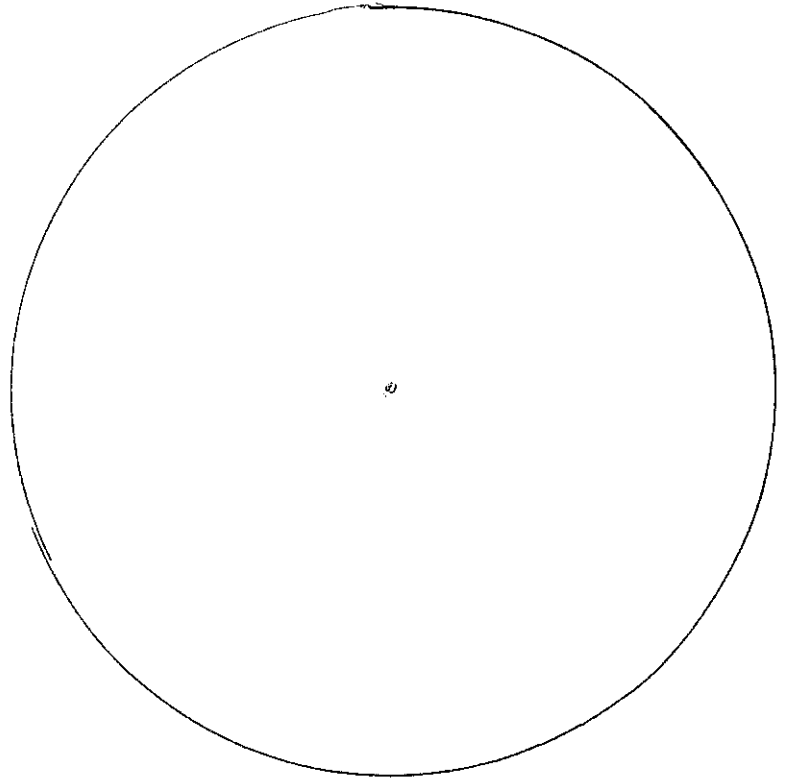
Square:

1. Draw the diameter of the circle. Label the endpoints A and B .
2. Construct the perpendicular bisector of \overline{AB} . Make sure this line goes all the way through the circle. Label where it crosses the circle C and D .
3. Connect A, B, C, D



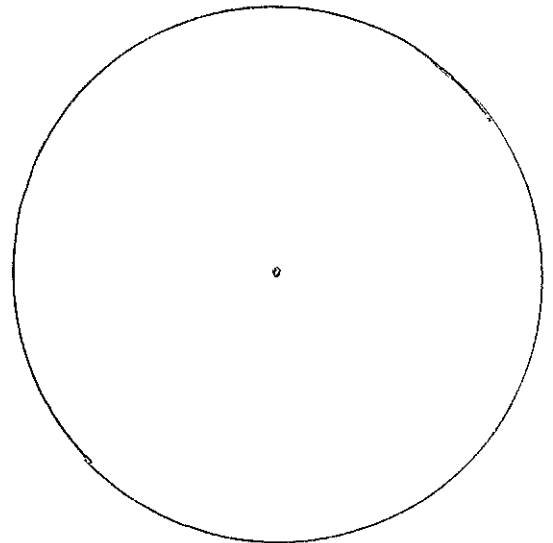
Hexagon:

1. Label the center of the circle O .
Place any point A on the circle.
2. open your compass the length of \overline{OA} .
This is the radius of your circle.
3. Compass on A , make an arc crossing the circle. Label it B .
4. compass on B , make an arc. Label it C .
Continue around the circle.
5. Connect A & B , B & C , and so on.



Equilateral triangle:

1. Label the center of your circle O . Place any point A on the circle.
2. open your compass the length of \overline{OA} . This is the radius of your circle.
3. Compass on A , make an arc crossing the circle. Label it B .
4. compass on B , make an arc. Label it C .
Continue around the circle.
5. Connect EVERY OTHER letter: A and C , C and E , E and A .



For additional help on constructions go to mathopenref.com

Three undefined terms in geometry:

Three transformations that use rigid motions to produce congruent figures:

Congruent means: _____

When figures are congruent, their sides are _____
and their angles are _____.

The transformation that produces similar figures: _____

When figures are similar, their sides are _____
and their angles are _____.

Medians are concurrent at the _____

Altitudes are concurrent at the _____

Angle bisectors are concurrent at the _____

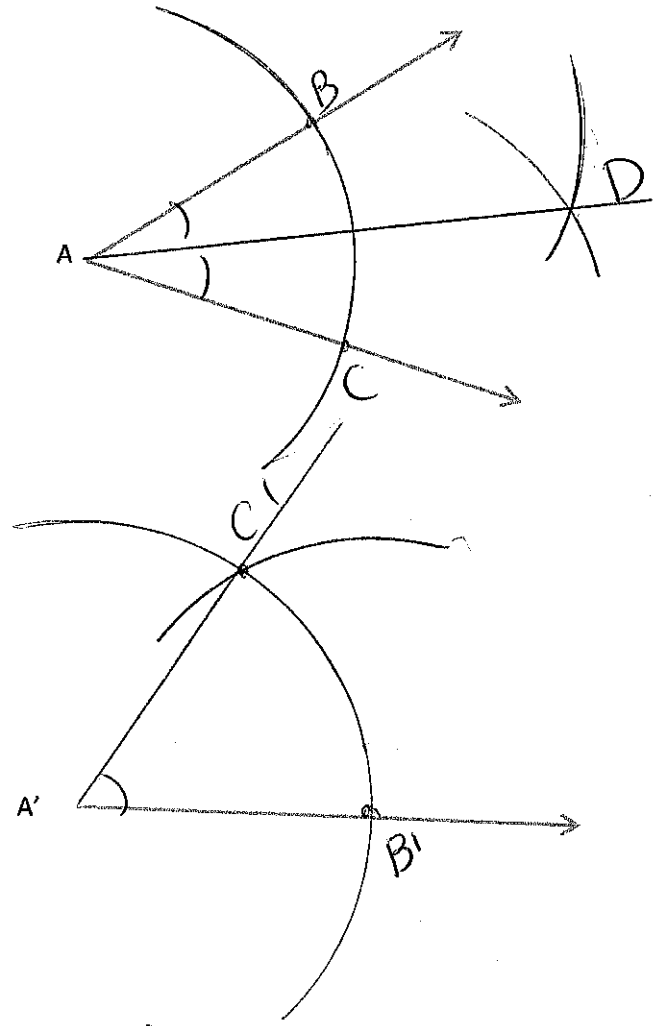
Perpendicular bisectors are concurrent at the _____



Name Key Geometry Exam Review #1: Constructions and Vocab

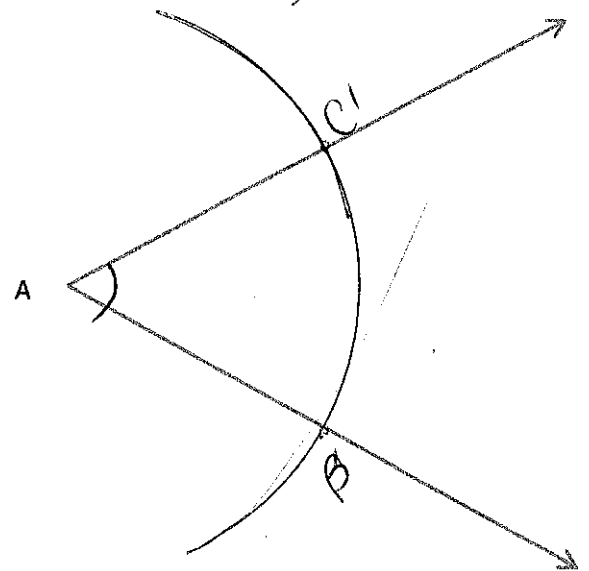
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- $\angle BAS \cong \angle B'A'C'$



Bisect an angle:

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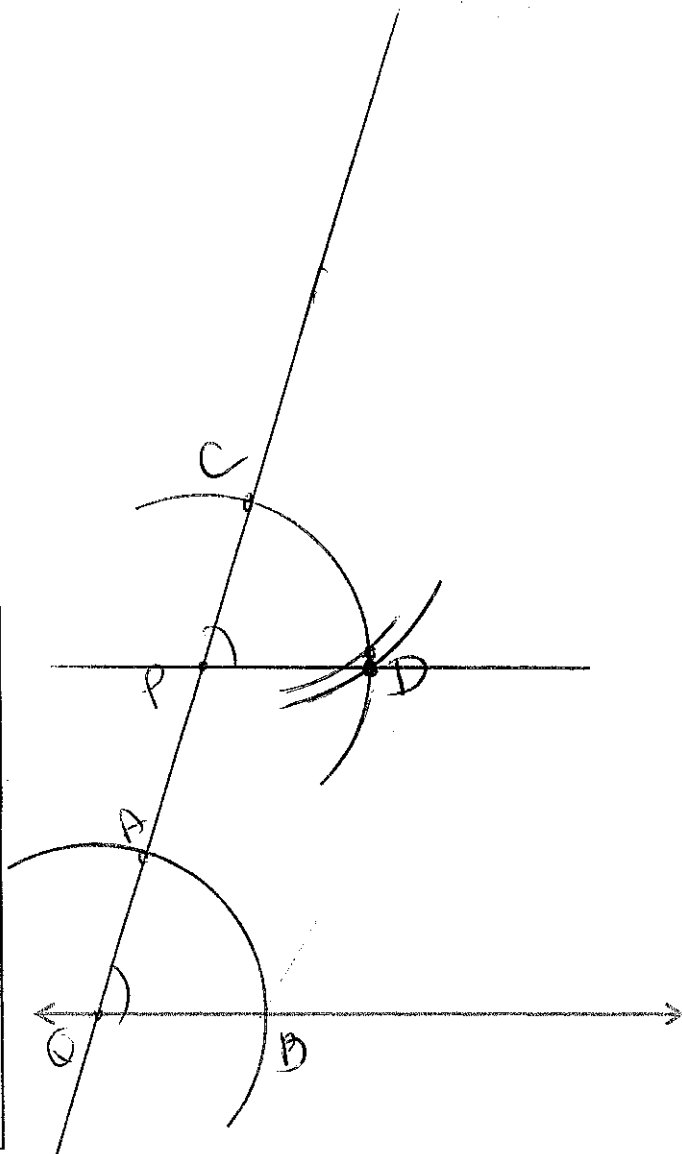


Parallel Lines:

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$$\overline{QB} \parallel \overline{PD}$$

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Circumcenter:

These all mean the same thing:

Find the **circumcenter**

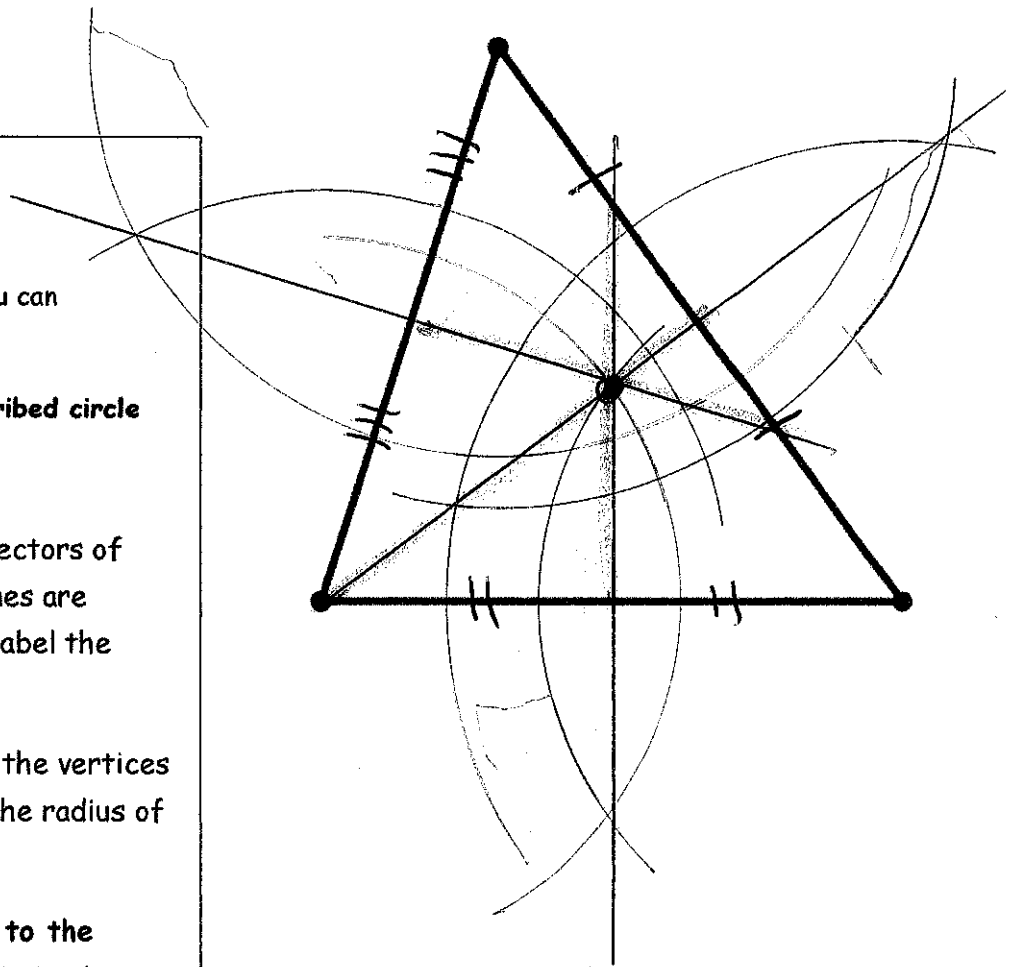
Find the **center of the circle** that you can circumscribe about a triangle

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Steps:

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***The circumcenter is equidistant to the vertices of the triangle because it is the radius of the circle.**

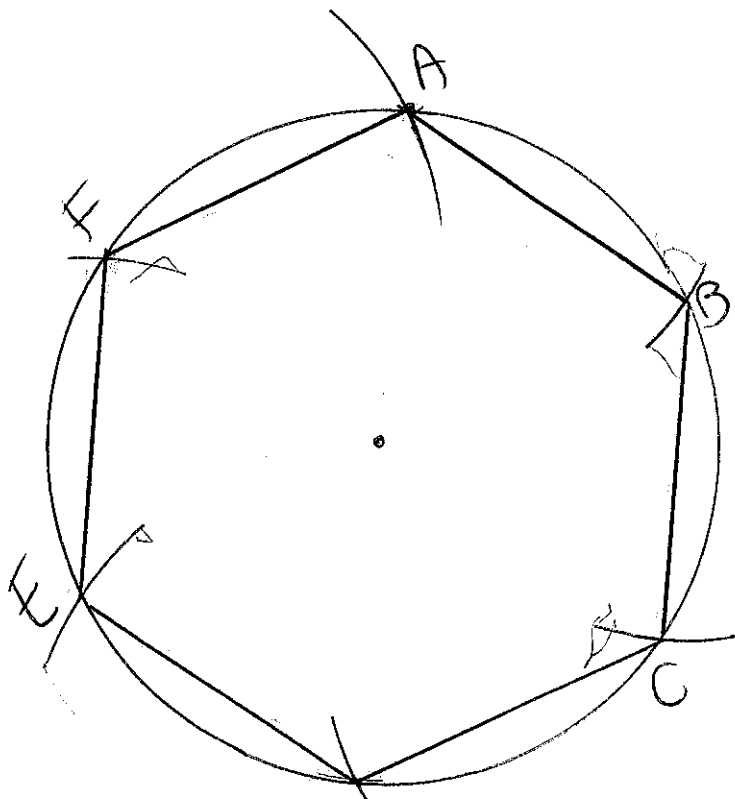


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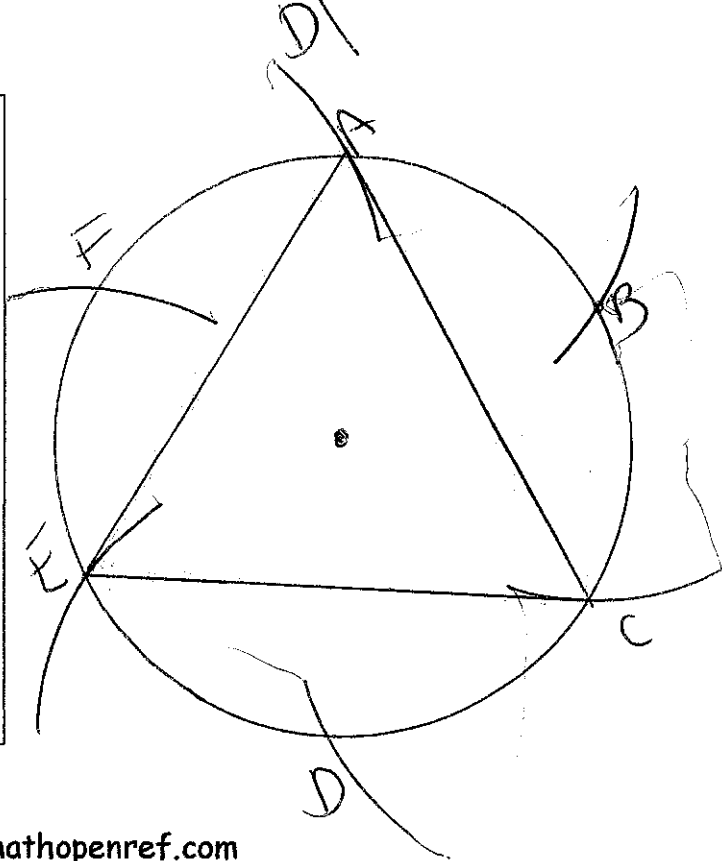
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5. Connect A & B , B & C , and so on.



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2. open your compass the length of \overline{OA} . This is the radius of your circle.
3. Compass on A , make an arc crossing the circle. Label it B .
4. compass on B , make an arc. Label it C . Continue around the circle.
5. Connect EVERY OTHER letter: A and C , C and E , E and A .



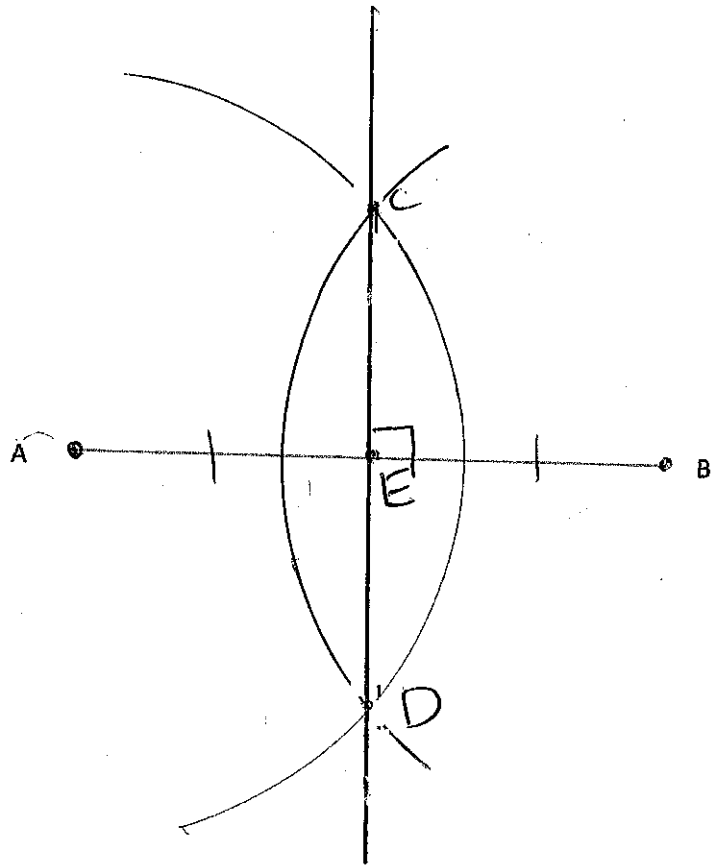
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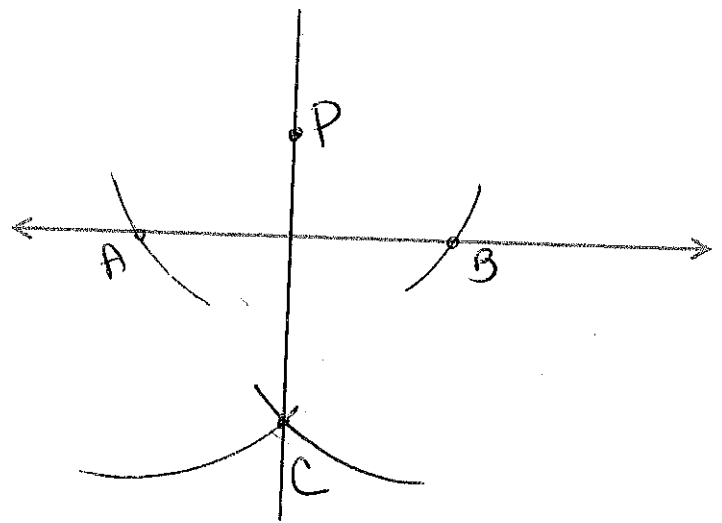
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Incenter:

These all mean the same thing:

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Find the center of the circle that is inscribed in a triangle

Construct the incircle, inscribed circle

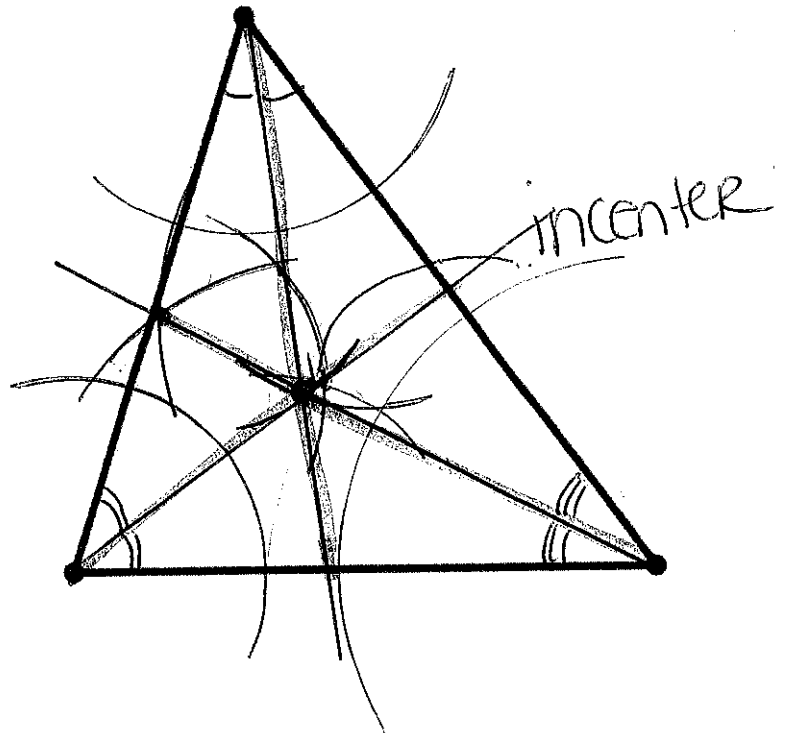
Steps:

Construct each angle bisector of a triangle. The bisectors are concurrent at the incenter. Call the incenter C .

Construct a line perpendicular from C to one of the sides of the triangle. This will be the radius of the circle.

Compass on C , open to the length of the radius, draw a circle. It should just graze the sides of the triangle.

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Three undefined terms in geometry:

point
line
plane

Three transformations that use rigid motions to produce congruent figures:

translation
reflection
rotation

Congruent means: equal in size

When figures are congruent, their sides are congruent
and their angles are congruent

The transformation that produces similar figures: dilation

When figures are similar, their sides are proportional
and their angles are congruent

Medians are concurrent at the centroid

Altitudes are concurrent at the orthocenter

Angle bisectors are concurrent at the incenter

Perpendicular bisectors are concurrent at the circumcenter

