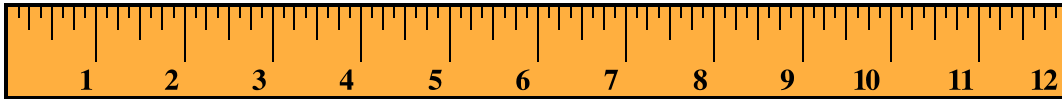


## The Tools

---

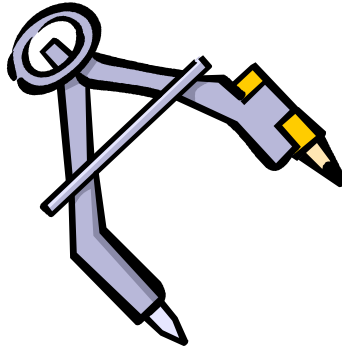
### RULER

- Use this when you know the length and location of a line segment
- Use this when you know the location of a ray or a line



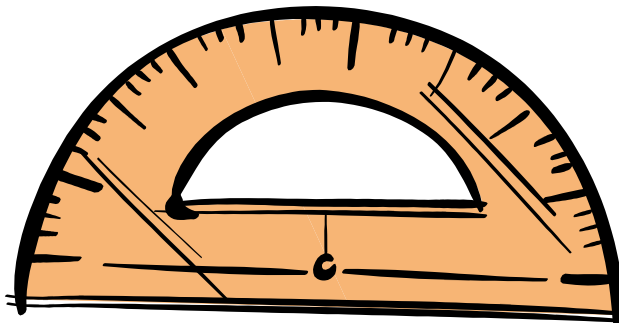
### COMPASS

- Use this when you know the length, but not the location of a line segment



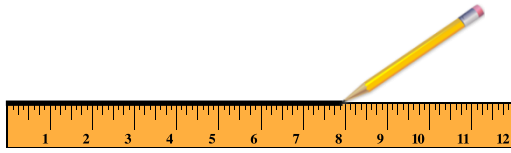
### PROTRACTOR

- Use this when you know the vertex and measure of an angle

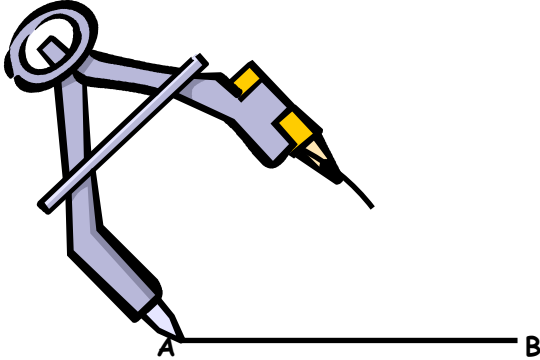


## Constructing SSS Triangles

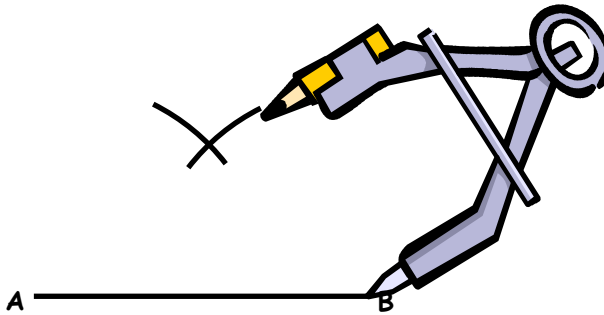
1. **RULER** – Draw the longest side. Label the endpoints A and B.



2. **COMPASS** – Measure the distance of one of the other sides. Place the metal point on point A. Draw an arc.

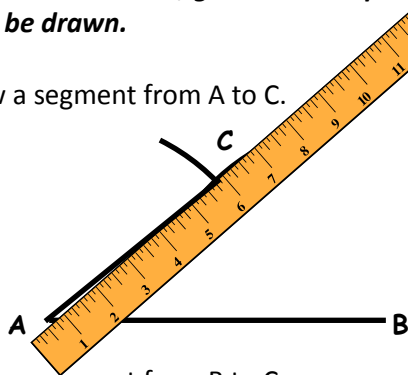


3. **COMPASS** – Measure the distance of the last side. Place the metal point on point B. Draw another arc. Label the point of intersection of the two arcs C.

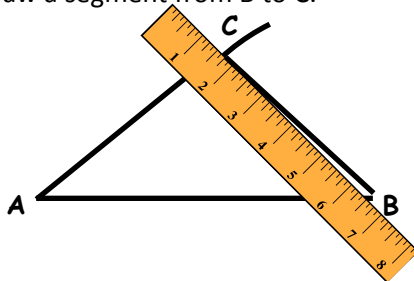


**NOTE:** If the arcs don't intersect, go back to Step 2 and try again. If it is impossible to make them intersect, then the triangle can't be drawn.

4. **RULER** – Draw a segment from A to C.



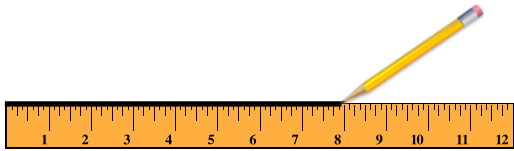
5. **RULER** – Draw a segment from B to C.



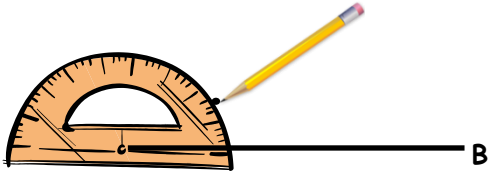
## Constructing SAS Triangles

---

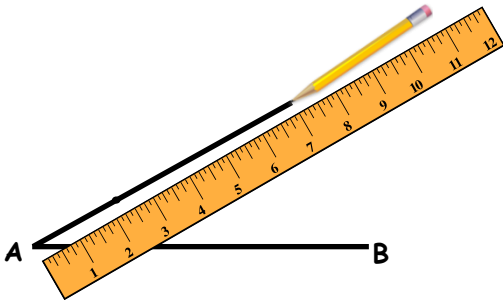
1. **RULER** – Draw the longer side. Label the endpoints A and B.



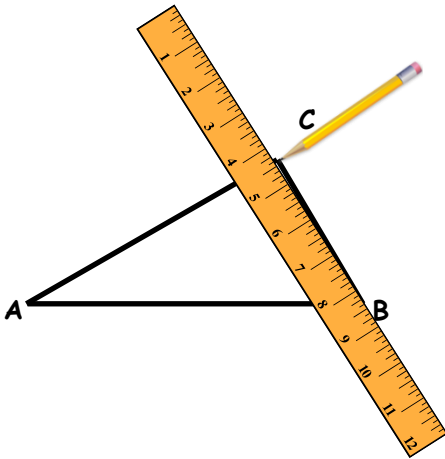
2. **PROTRACTOR** – Place the vertex at A. Using the inner protractor, find the angle and draw a point there.



3. **RULER** – Starting at A, draw a segment that is the length of the shorter side. Call the other endpoint C.



4. **RULER** – Draw a segment from B to C.

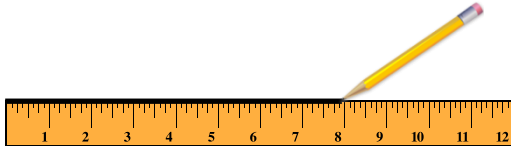


**NOTE:** *It is always possible to draw a triangle using SAS.*

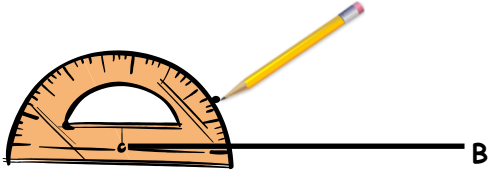
## Constructing ASA Triangles

---

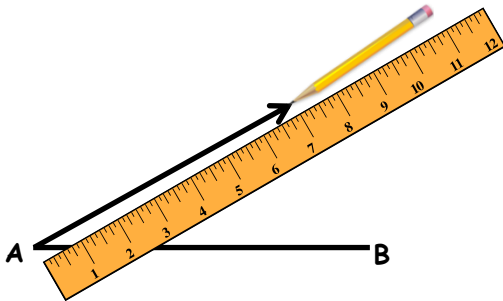
1. **RULER** – Draw the longest side. Label the endpoints A and B.



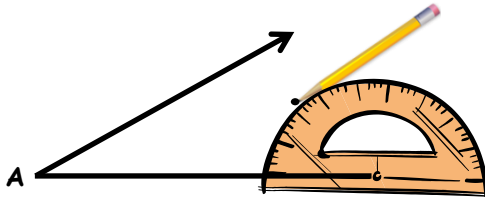
2. **PROTRACTOR** – Place the vertex at A. Using the inner protractor, find one of the angles and draw a point there.



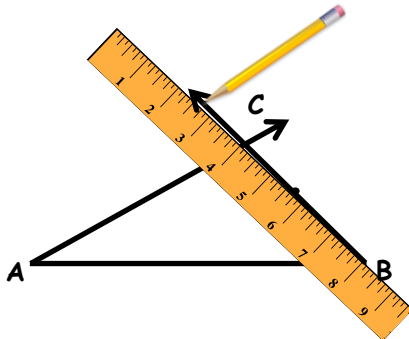
3. **RULER** – Draw a ray that starts at A and goes through and beyond the newest point.



4. **PROTRACTOR** – Place the vertex at B. Using the outer protractor, find the other angle and draw a point there.



5. **RULER** – Draw a ray that starts at B and goes through and beyond the newest point. Label the point of intersection of the two rays C.



**NOTE:** If the rays don't intersect, go to Step 2 and try again. It is always possible to draw a triangle using ASA.

## Constructing AAS Triangles

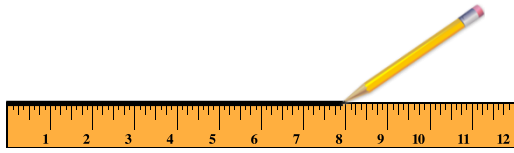
---

1. **CALCULATOR** – Calculate the third angle. Replace the non-adjacent angle with this one.

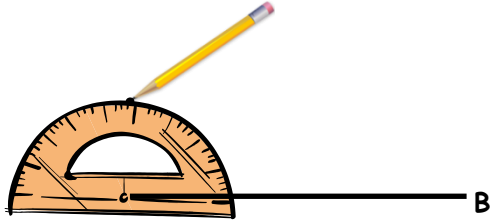
**NOTE:** From this point. You can follow the instructions for ASA.

## Constructing HL Triangles

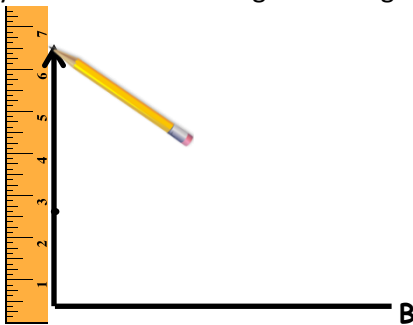
1. **RULER** – Draw the leg. Label the endpoints A and B.



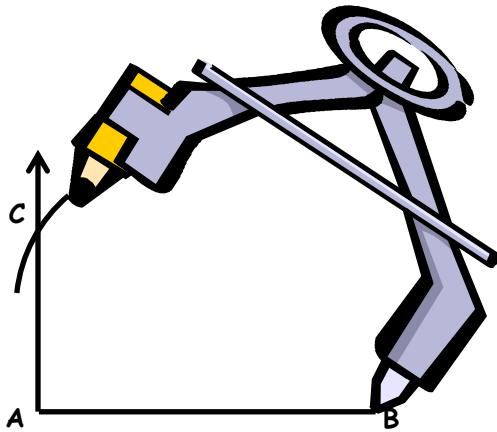
2. **PROTRACTOR** – Place the vertex at A. Find 90 degrees on the protractor and draw a point there.



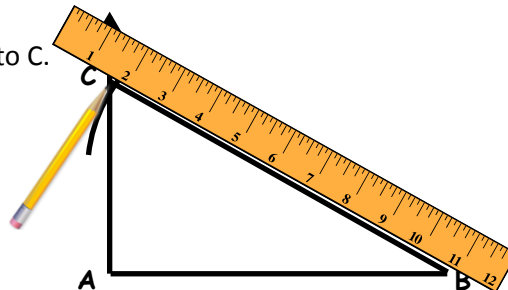
3. **RULER** – Draw a ray that starts at A and goes through and beyond the newest point.



4. **COMPASS** - Measure the distance of the hypotenuse. Place the metal point on point B. Draw an arc that intersects the ray. Label the point of intersection C.



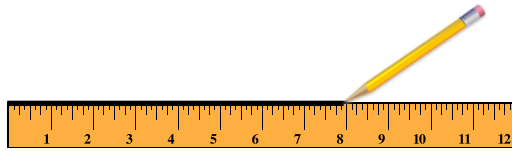
5. **STRAIGHT EDGE** – Draw a segment from B to C.



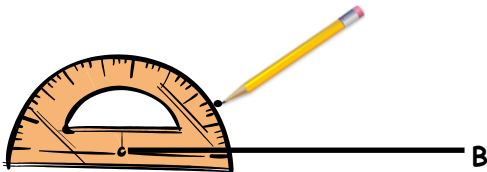
**NOTE:** If the rays don't intersect, go back to Step 2 and try again. It is always possible to draw a triangle using HL.

## Constructing AAA Triangles

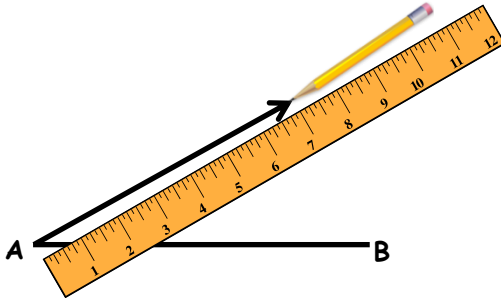
1. **RULER** – Draw a segment of any length. Label the endpoints A and B.



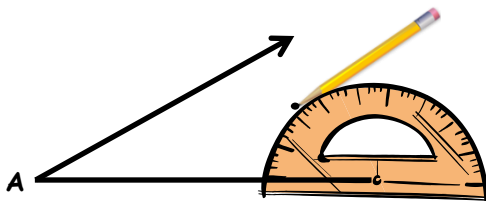
2. **PROTRACTOR** – Place the vertex at A. Using the inner protractor, find one of the angles and draw a point there.



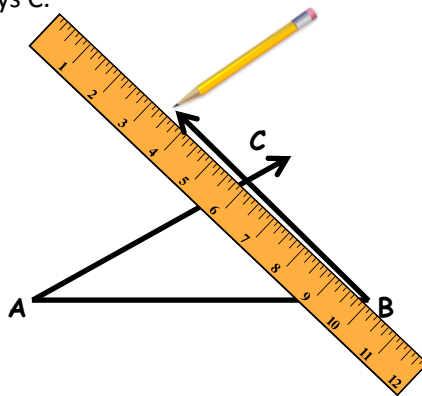
3. **RULER** – Draw a ray that starts at A and goes through and beyond the newest point.



4. **PROTRACTOR** – Place the vertex at B. Using the outer protractor, find another angle and draw a point there.



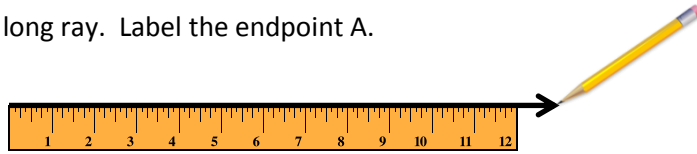
5. **RULER** – Draw a ray that starts at B and goes through and beyond the newest point. Label the point of intersection of the two rays C.



**NOTE:** If the rays don't intersect, go to Step 2 and try again. It is always possible to draw a triangle using AAA.

## Constructing SSA Triangles

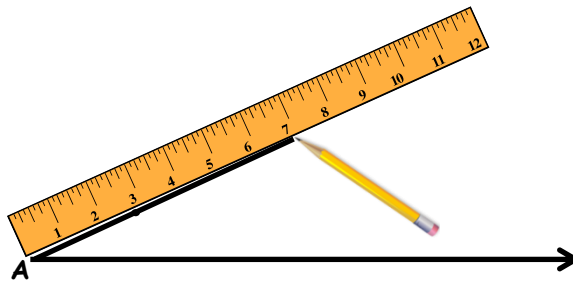
1. **RULER** – Draw a long ray. Label the endpoint A.



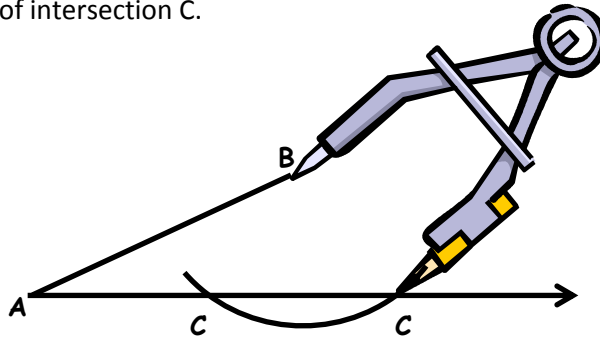
2. **PROTRACTOR** – Place the vertex at A. Using the inner protractor, find the angle and draw a point there.



3. **RULER** – Draw the adjacent side, starting at A and going through and beyond the newest point. Label the endpoint of this segment B.

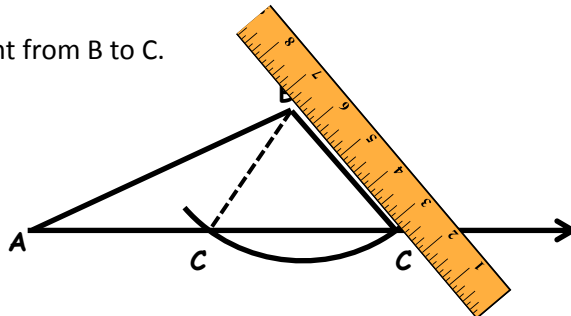


4. **COMPASS** – Measure the other side. Place the metal point on point B. Draw an arc that intersects the ray. Label the point of intersection C.



**NOTE:** It is possible for there to be two points where the arc intersects the ray. In that case, you may choose either point of intersection to be C.

5. **RULER** – Draw a segment from B to C.



**NOTE:** If the arc and the ray do not intersect, go back to step 3 and try again. If it is impossible to make them intersect, then the triangle can't be drawn.