**Activity 2.7.2 Construction of an Angle Bisector**

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**Construction**

Given: $∠CAB$

To construct: the ray from *A* that bisects $∠CAB$

Steps in the construction:

1. Construct the circle with center *A* passing through *B*.
2. Label the point where the circle and ray $\overbar{AC}$ intersect at point *D.*
3. Construct the circle with center *D* passing through *B*.
4. Construct the circle with center *B* passing through *C*.
5. Label point *E* as one of the points where these last two circles intersect.

Claim: Ray $\rightharpoonaccent{AE}$ bisects $∠CAB$



**Proof**

1. Construct segments $\overbar{BD}$, $\overbar{BE}$ and $\overbar{DE}$.
2. As in the proof for the equilateral triangle construction, *BE* = *DE.* Explain why.
3. *AB = AD* because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. *AE = AE* because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. Now we can show that ∆ \_\_\_\_\_\_ $≅ $∆ \_\_\_\_\_\_ by the \_\_\_\_\_\_ Congruence Theorem.
6. $∠BAE$ $≅∠DAE$ because corresponding \_\_\_\_\_\_\_\_\_\_\_\_ of congruent triangles are \_\_\_\_\_\_\_\_\_\_\_\_\_
7. $By definition of bisect, Ray \rightharpoonaccent{AE} bisects ∠CAB$ because it divides $∠CAB$ into \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.