**Activity 2.7.4 Construction of a Perpendicular to a Line
from a Point not on the Line**

**Construction**

Given: $\overleftrightarrow{AB }$with *C* a point not on $\overleftrightarrow{AB }$

To construct: a line passing through C and perpendicular to $\overleftrightarrow{AB }$



Steps in the construction:

1. Construct the circle with center *C* passing through *A.*
2. Label the other point where the circle intersects $\overleftrightarrow{AB }$ as point *D*.
3. Construct an equilateral triangle ∆*ADF* with side $\overbar{AD}$.
4. Draw the line through *C* and *E*.
5. ****Label point *F*, the intersection of $\overleftrightarrow{AB }$ and $\overleftrightarrow{CE}$.

Claim: $\overleftrightarrow{CE}$ $⊥$ $\overleftrightarrow{AB}$.

**Proof**

1. Construct segments $\overbar{AC}$, $\overbar{DC}$, $\overbar{AE}$, and $\overbar{DE}$.
2. Show that ∆*CAE* $≅ $∆*CDE.* (Write out the steps)

3. Explain why $∠ACE$ $≅$ $∠DCE$.

1. Show that ∆*CAF* $≅ $∆*CDF.* (Write out the steps)
2. $∠AFC$ $≅$ $∠DFC$ because \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Explain why $\overleftrightarrow{CE}$ $⊥$ $\overleftrightarrow{AB}$.