

Here are three basic constructions and one theorem. You will need to supply diagrams using your compass and straightedge. On two of them, you will need to also supply the steps. All of them need a brief paragraph explaining *why it works* using the construction facts list on the back.

### More Basic Constructions

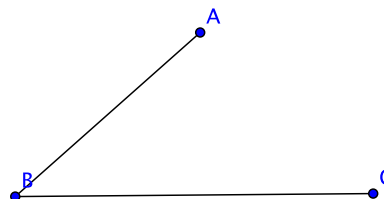
1. **Angle Bisector**

**Given:**  $\angle ABC$

**Construct:** point  $D$  such that  $\overrightarrow{BD}$  bisects  $\angle ABC$

**Steps:**

- (1)  $E = \odot B_A \cap \overrightarrow{BC}$
- (2)  $D = \odot A_B \cap \odot E_B$
- (3)  $\overrightarrow{BD}$



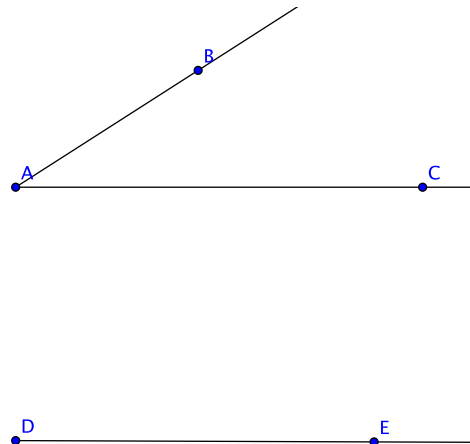
**Why it Works:**

2. **Copy Angle**

**Given:**  $\angle BAC$  and  $\overrightarrow{DE}$

**Construct:**  $\angle EDF$  which is congruent to  $\angle BAC$

**Steps:**



**Why it Works:**

3. **Perpendicular Bisector**

**Given:**  $\overline{AB}$

**Construct:**  $\overleftrightarrow{CD}$  such that  $\overleftrightarrow{CD}$  is the perpendicular bisector of  $\overline{AB}$

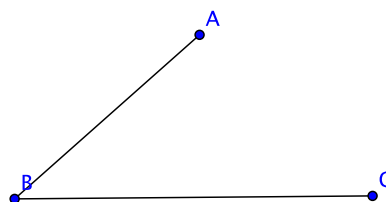
**Steps:**



**Why it Works:**

4. **Angle Bisector- Point Theorem**

**Given:** Given  $P$  on bisector of  $\angle ABC$   
**Prove:**  $P$  is equidistant to  $\overline{BA}$  and  $\overline{BC}$   
 (You will need to construct the complete diagram.)



**Game plan:**

**Construction Facts**

Here is the beginning of a list of fact (true statements) you can use to explain your constructions.

1. Two circles are congruent if and only if the radius distances of the two circles are equal.

$$\odot A_x \cong \odot B_y \iff x = y$$

2. The diagonals of a rhombus bisect each other.
3. You may use any theorem or postulate we have discussed in class. For example, consider SSS, ASA, and SAS.
4. The distance between a point and a line is the length of the segment from the point perpendicular to the line.