

Chapter 1: Tools of Geometry  
1-7: Basic Constructions

Day 3

Definitions:

Draw: Sketch "free hand"

Construct: use a compass and ruler

1. Constructing Congruent Segments (copying line segments)

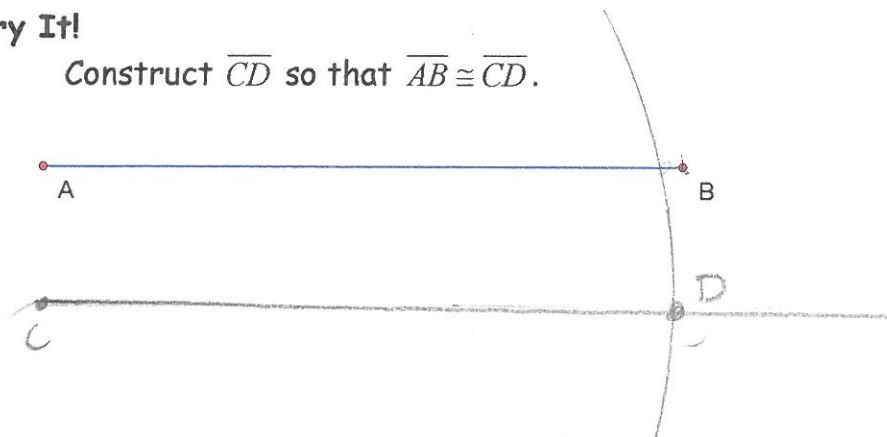
STEPS: 1) Draw a ray with endpoint  $C$  (use a ruler to make sure it is nice and straight).

2) Open the compass to the length of  $\overline{AB}$ .

3) With the same compass setting, put the compass point on  $C$ . Draw an arc that intersects the ray. Label the point of intersection  $D$ .

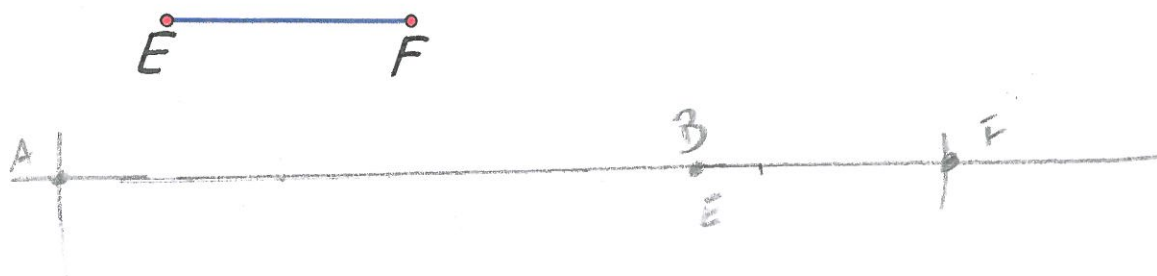
Try It!

Construct  $\overline{CD}$  so that  $\overline{AB} \cong \overline{CD}$ .



Now Try This!

Construct  $\overline{AE}$  so that  $\overline{AF} + \overline{EF} = \overline{AE}$

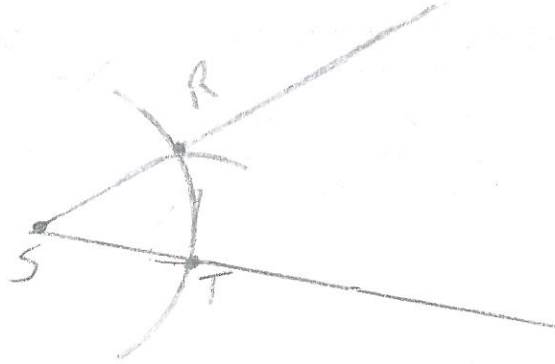
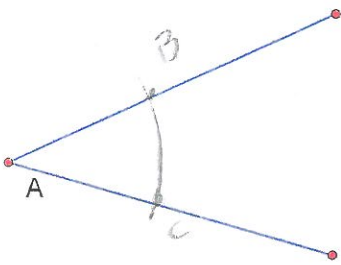


## 2. Construct Congruent Angles (copying an angle)

- STEPS:**
- 1) Draw a ray with endpoint S.
  - 2) With the compass on point A, draw an arc that intersects the sides of  $\angle A$ . Label the points of intersection B and C.
  - 3) With the same compass setting, put the compass on point S. Draw an arc and label its point of intersection with the ray as R.
  - 4) Open the compass to length BC. Keeping the same compass setting, put the compass point on R. Draw an arc to locate point T.
  - 5) Draw  $\overline{ST}$ .

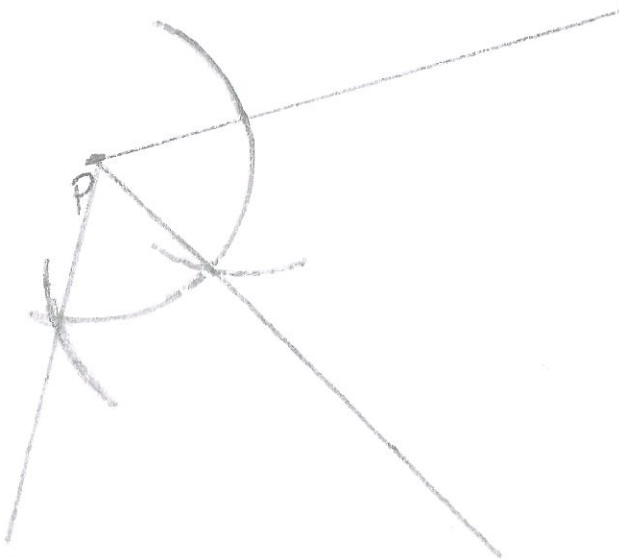
**Try It!**

Construct  $\angle S$  so that  $\angle A \cong \angle S$



**Now Try This!**

Construct  $\angle P$  so that  $2m\angle S = m\angle P$

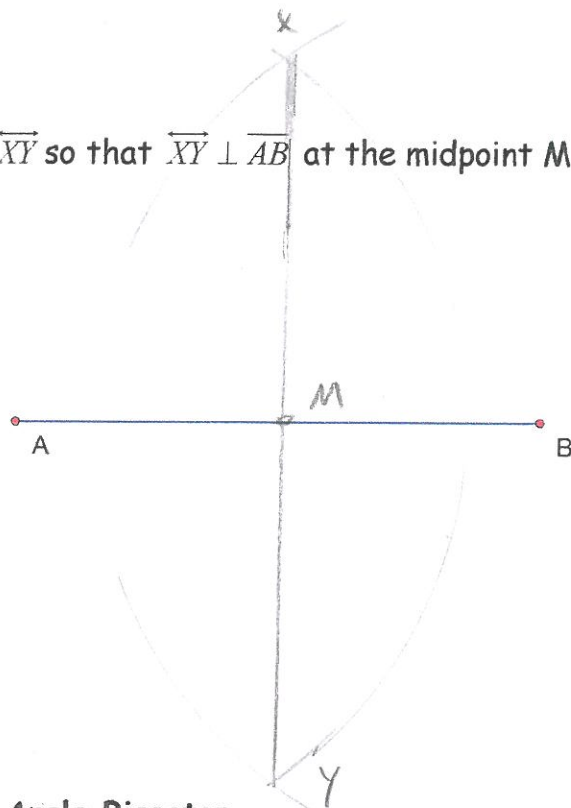


### 3. Construct a Perpendicular Bisector

- STEPS:** 1) Put the compass on point A and draw a long arc (the opening of the compass must be greater than  $\frac{1}{2}AB$ .)
- 2) With the same compass setting put the compass point on point B and draw another long arc. Label the points where the two arcs intersect X and Y.
- 3) Draw  $\overline{XY}$ . The point of intersection of  $\overline{AB}$  and  $\overline{XY}$  is M, the midpoint of  $\overline{AB}$ .

**Try It!**

Construct  $\overline{XY}$  so that  $\overline{XY} \perp \overline{AB}$  at the midpoint M of  $\overline{AB}$ .



### 4. Construct the Angle Bisector

- STEPS:** 1) Put the compass point on vertex A. Draw an arc that intersects the sides of  $\angle A$ . Label the points of intersection B and C.
- 2) Put the compass on point C and draw an arc. With the same compass setting, draw an arc using point B. Be sure the two arcs intersect. Label the point where the two arcs intersect as X.
- 3) Draw  $\overline{AX}$ .

**Try It!**

Bisect  $\angle A$

