




Construction 1

Copy A Line Segment

<p>1. To draw a line segment congruent to \overline{AB}, use a straightedge to draw a reference line. Call it l. Label the end point on l as K</p>	
<p>2. Place the point of the compass on point A. Stretch the compass so that the pencil is exactly on B. Make a mark.</p>	
<p>3. Without changing the span of the compass, place the compass point on K and swing the pencil so that it crosses the reference line. Label this crossing point Y.</p>	

$$\overline{AB} \cong \overline{KY}$$

Construction 2

Bisect A Segment

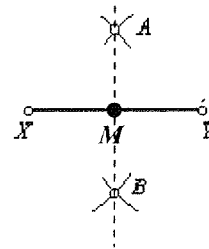
(Construct the midpoint of a line segment)

1. Begin with line segment XY .

2. Place the compass at point X . Adjust the compass radius so that it is more than $(1/2)XY$. Draw two arcs as shown here.

3. Without changing the compass radius, place the compass on point Y . Draw two arcs intersecting the previously drawn arcs. Label the intersection points A and B .

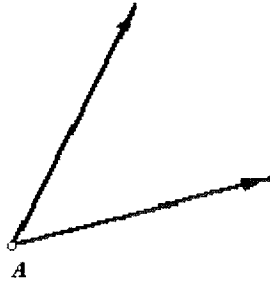
4. Using the straightedge, draw line AB . Label the intersection point M .
Point M is the midpoint of line segment XY .



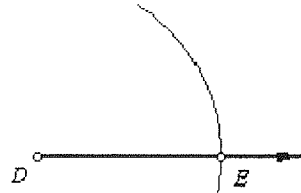
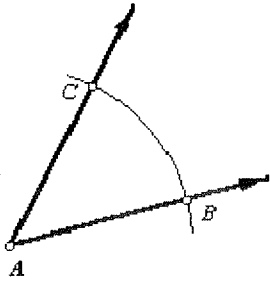
$$\overline{XM} \cong \overline{YM}$$

Construction 3 Copy An Angle

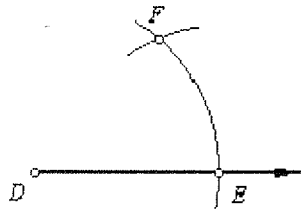
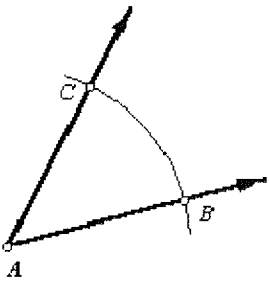
1. To draw an angle congruent to $\angle A$, begin by drawing a ray with endpoint D .



2. Place the compass on point A and draw an arc across both sides of the angle. Without changing the compass radius, place the compass on point D and draw a long arc crossing the ray. Label the three intersection points as shown.

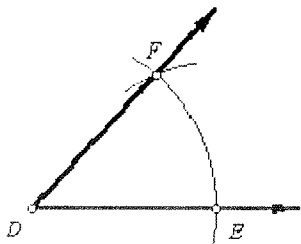
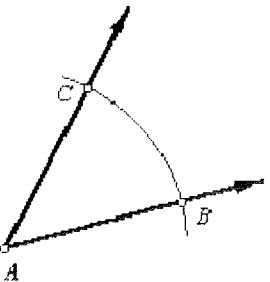


3. Set the compass so that its radius is BC . Place the compass on point E and draw an arc intersecting the one drawn in the previous step. Label the intersection point F .



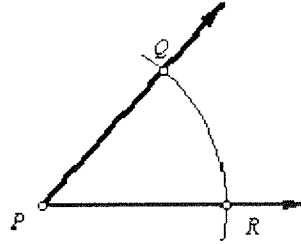
4. Use the straightedge to draw ray DF .

$$\angle EDF \cong \angle BAC$$

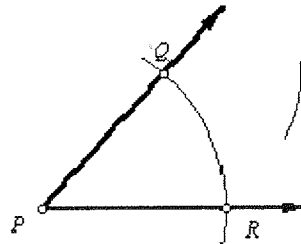


Construction 4 Bisect an Angle

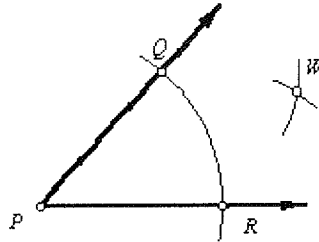
1. Let point P be the vertex of the angle. Place the compass on point P and draw an arc across both sides of the angle. Label the intersection points Q and R .



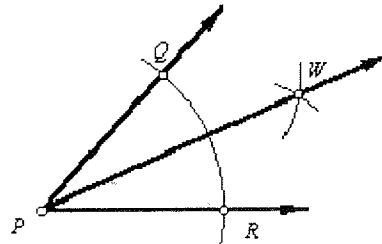
2. Place the compass on point Q and draw an arc across the interior of the angle.



3. Without changing the radius of the compass, place it on point R and draw an arc intersecting the one drawn in the previous step. Label the intersection point W .



4. Using the straightedge, draw ray PW . This is the bisector of $\angle QPR$.



$$\angle QPW \cong \angle RPW$$

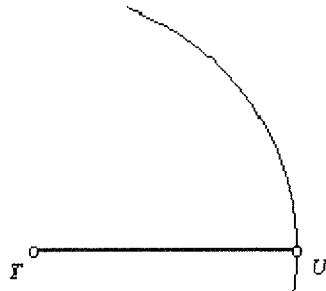
Construction 5

Construct An Equilateral Triangle (or Construct a 60° Angle)

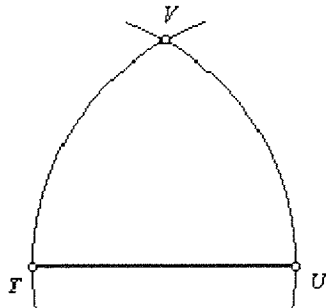
1. Begin with line segment TU .



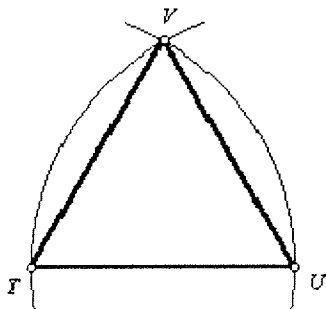
2. Center the compass at point T , and set the compass radius to TU . Draw an arc as shown.



3. Keeping the same radius, center the compass at point U and draw another arc intersecting the first one. Let point V be the point of intersection.



4. Draw line segments TV and UV . Triangle TUV is an equilateral triangle, and each of its interior angles has a measure of 60° .

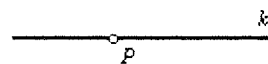


Construction 6

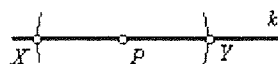
Construct a perpendicular through a point on a line

Given point P on line k , construct a line through P , perpendicular to k .

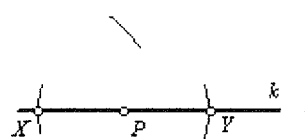
1. Begin with line k , containing point P .



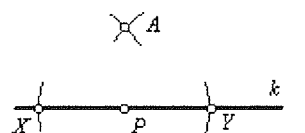
2. Place the compass on point P . Using an arbitrary radius, draw arcs intersecting line k at two points. Label the intersection points X and Y .



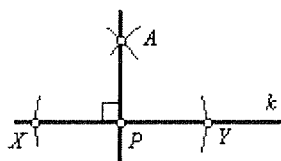
3. Place the compass at point X . Adjust the compass radius so that it is more than $(1/2)XY$. Draw an arc as shown here.



4. Without changing the compass radius, place the compass on point Y . Draw an arc intersecting the previously drawn arc. Label the intersection point A .



5. Use the straightedge to draw line AP . Line AP is perpendicular to line k .

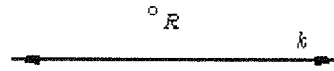


Construction 7

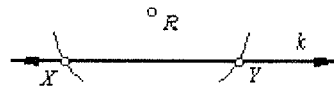
Given a point not on a line, construct a perpendicular line through the given point

Given point R , not on line k , construct a line through R , perpendicular to k .

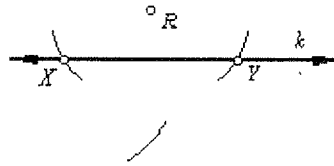
1. Begin with point line k and point R , not on the line.



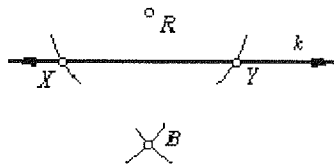
2. Place the compass on point R . Using an arbitrary radius, draw arcs intersecting line k at two points. Label the intersection points X and Y .



3. Place the compass at point X . Adjust the compass radius so that it is more than $(1/2)XY$. Draw an arc as shown here.



4. Without changing the compass radius, place the compass on point Y . Draw an arc intersecting the previously drawn arc. Label the intersection point B .



5. Use the straightedge to draw line RB . Line RB is perpendicular to line k .

