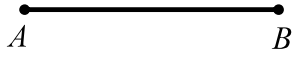
constructions!

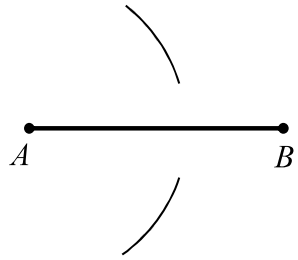
Follow the directions to create the basic constructions.

Type I: Perpendicular Bisector of a Segment

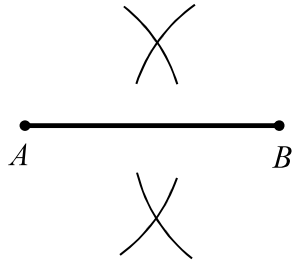
Goal: Draw the perpendicular bisector to $\overline{AB}$.



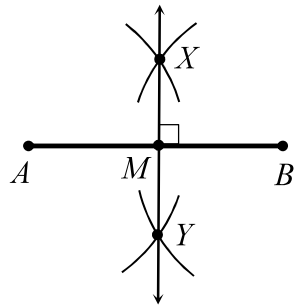
Step 1: Place the compass at point A. Adjust the radius so it's more than one half the length of the segment. Draw two arcs as shown.



Step 2: Keeping the same compass radius, place the compass on point B. Draw two more arcs intersecting the previous arcs. Label the intersection points X and Y.

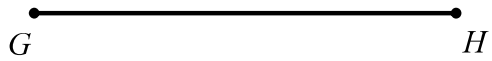


Step 3: Using a straight edge, draw $\overleftrightarrow{XY}$. Label the intersection M.

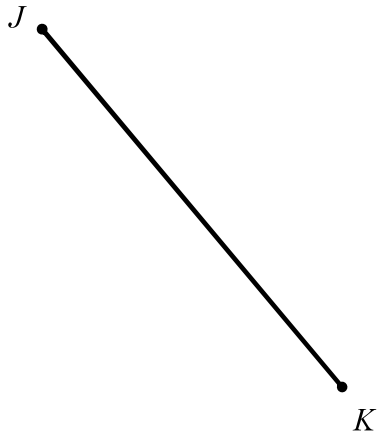


Now you Try! Draw the perpendicular bisector of each given segment.

1)

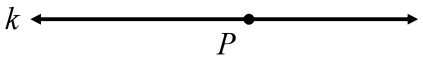


2)

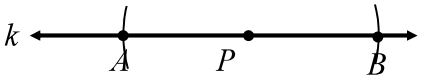


Type 2: Perpendicular through a Point on the Line

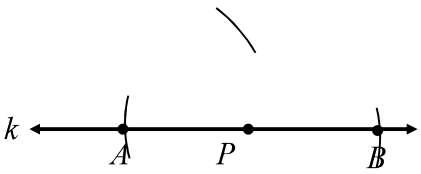
Goal: Draw a line perpendicular to line k, through point P.



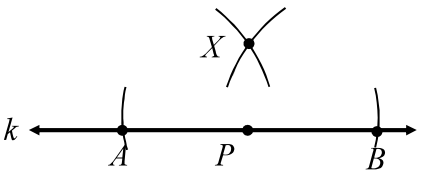
Step 1: Place the compass on point P. Using any radius, draw arcs intersecting line k at two points. Label the intersection points A and B.



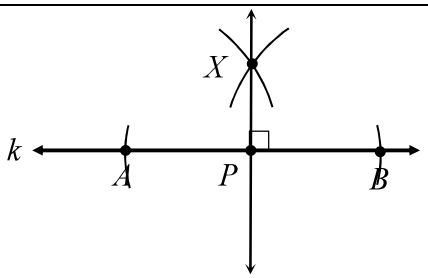
Step 2: Place the compass at point A. Adjust the radius so it's more than one half the length of $\overline{AB}$. Draw an arc as shown.



Step 3: Keeping the same radius, place the compass at point B. Draw an arc intersecting the previously drawn arc. Label the intersection point X.

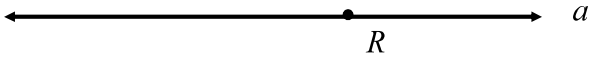


Step 4: Using a straightedge, draw $\overleftrightarrow{XP}$.

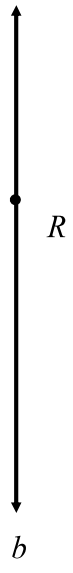


Now you Try! Draw a line perpendicular to the given line, through point R.

1)

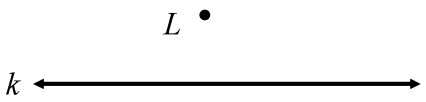


2)

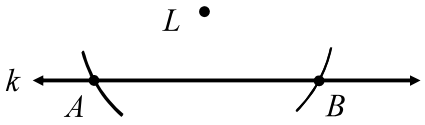


Type 3: Perpendicular through a Point not on the Line

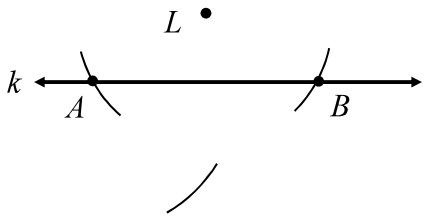
Goal: Draw a line perpendicular to line k, through point L.



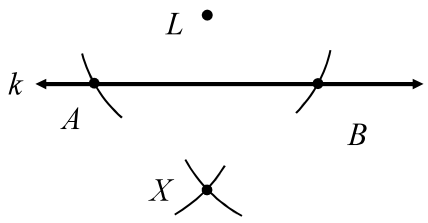
Step 1: Place the compass on point L. Using any radius, draw arcs intersecting line k at two points. Label the intersection points A and B.



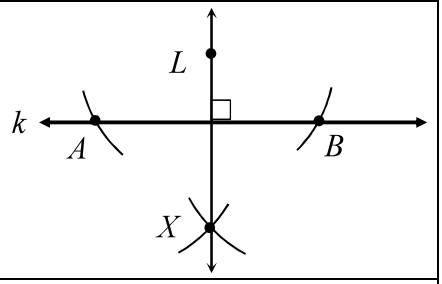
Step 2: Place the compass at point A. Adjust the radius so it's more than one half the length of AB. Draw an arc as shown.



Step 3: Keeping the same radius, place the compass at point B. Draw an arc intersecting the previously drawn arc. Label the intersection point X.

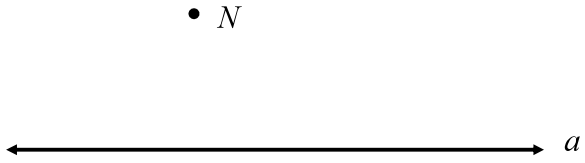


Step 4: Using a straightedge, draw $\overleftrightarrow{LX}$.

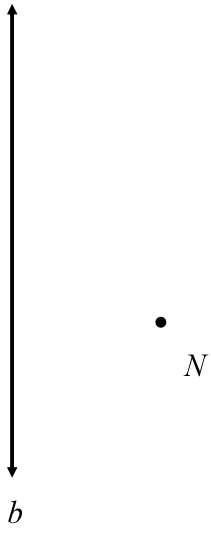


Now you Try! Draw a line perpendicular to the given line, through point N.

1)

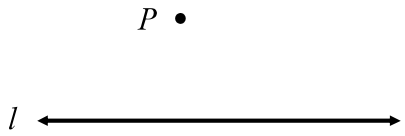


2)

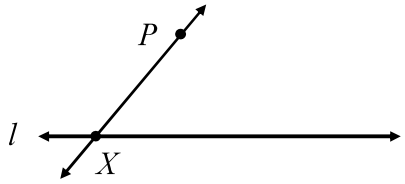


Type 4: Line Parallel to a Given Line, through a Given Point

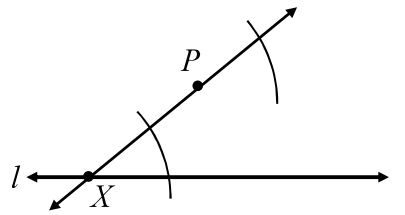
Goal: Draw a line parallel to line l, through point P.



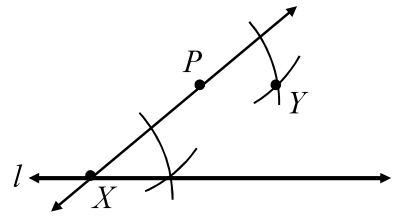
Step 1: Using a straightedge, draw a line through point P, intersecting line l as shown. Label the intersection point X.



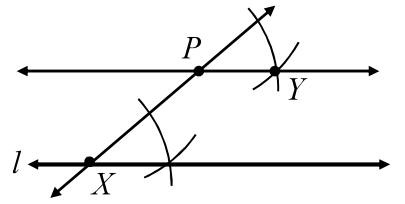
Step 2: Place the compass on point X and draw an arc intersecting both lines. Keeping the same radius, place the compass on point P and draw another arc.



Step 3: Set the compass radius to the distance between the two intersection points of the first arc. Now, place the compass at the point where the second arc intersected $\overleftrightarrow{PX}$. Draw another arc, and mark this intersection point Y.

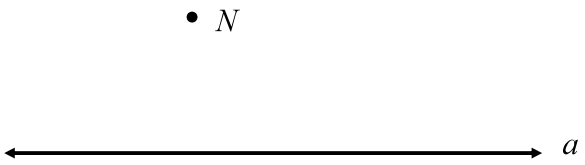


Step 4: Using a straightedge, draw $\overleftrightarrow{PY}$.

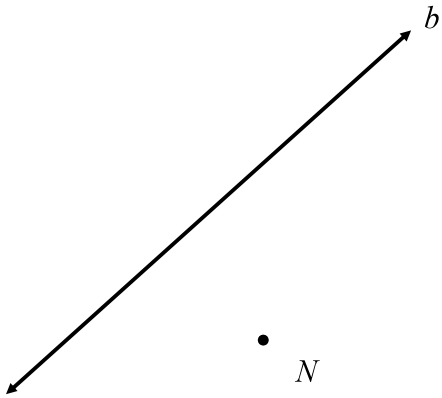


Now you Try! Draw a line parallel to the given line, through point N.

1)

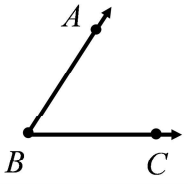


2)

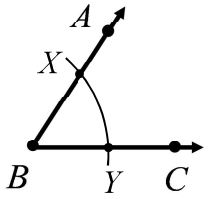


Type 5: Angle Bisector

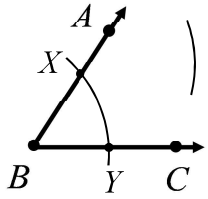
Goal: Construct the bisector of $\angle ABC$.



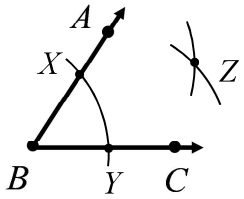
Step 1: Place the compass on the vertex of the angle. Draw an arc that intersects both sides of the angle. Label the intersection points X and Y.



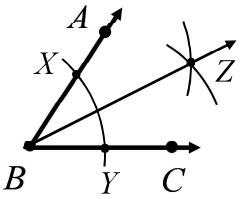
Step 2: Place the compass on point X and draw an arc on the interior of the angle.



Step 3: Without changing the radius, place the compass on point Y and draw another arc, intersecting the arc drawn in the last step. Label the intersection point Z.

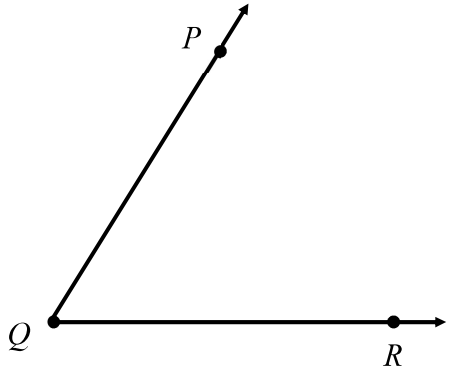


Step 4: Using a straightedge, draw $\overrightarrow{BZ}$.

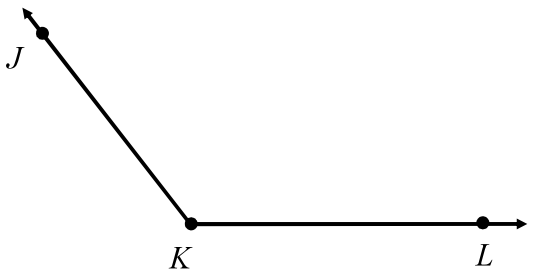


Now you Try! Construct the bisector of each given angle.

1)

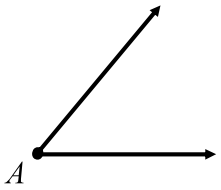


2)

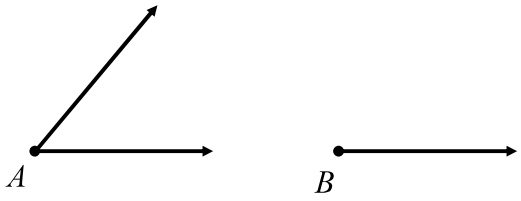


Type 6: Congruent Angles

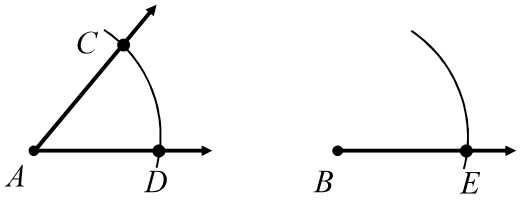
Goal: Construct an angle congruent to $\angle A$.



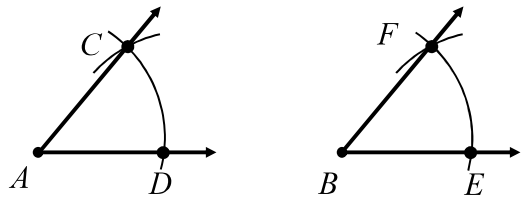
Step 1: Begin by drawing a ray with endpoint B.



Step 2: Place the compass on point A and draw an arc intersecting both sides of the angle. Without changing the radius, place the compass on point B and draw a long arc. Label the intersection points as C, D, and E.

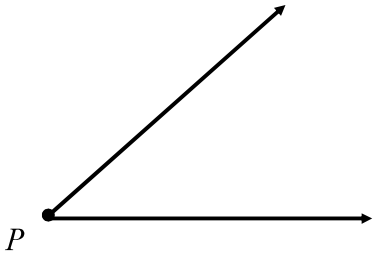


Step 3: Set the radius of the compass to the length of CD. Place the compass on point E and draw an arc intersecting the previous arc. Label the intersection point F. Draw $\overrightarrow{BF}$.



Now you Try! Given each angle, construct a congruent angle.

1)



2)