Constructing a Parallelogram

Follow each step carefully. Use a clean sheet of paper.

Step 1: Draw an angle and label it *ABC*.

Step 2: Place the compass anchor at B and the pencil point at C. Without changing your compass opening, place the compass anchor on A and draw an arc.



• C

В

Step 3: Place the compass anchor at B and the pencil point at A. Without changing your compass opening, place the compass anchor on C and draw another arc that crosses the first arc. Label the point where the two arcs cross as D.

Step 4: Draw line segments *AD* and *CD*.





Check Your Understanding

Use a compass and straightedge to construct a parallelogram.



Constructing a Perpendicular Line Segment (Part 1)

Let P be a point on line segment AB. You can construct a line segment that is perpendicular to line segment AB at point P.

Follow each step carefully. Use a clean sheet of paper.

- **Step 1:** Draw line segment AB. Make a dot on \overline{AB} , and label it as P.
- **Step 2:** Place the compass anchor on P, and draw an arc that crosses \overline{AB} . Label the point where the arc crosses the segment as C.

Keeping the compass anchor on point P and keeping the same compass opening, draw another arc that crosses \overline{AB} . Label the point where the arc crosses the segment as D.

Step 3: Make sure the compass opening is greater than the length of \overline{CP} . Place the compass anchor on *C* and draw an arc above \overline{AB} .

Keeping the same compass opening, place the compass anchor on D and draw another arc above \overline{AB} that crosses the first arc.

Label the point where the two arcs cross as Q.

Step 4: Draw \overline{QP} .

 \overline{QP} is **perpendicular** to \overline{AB} .



Use a protractor to check that the segments are perpendicular.









R

Constructing a Perpendicular Line Segment (Part 2)

М

Let M be a point that is *not* on line segment PQ. You can construct a line segment with one endpoint at M that is perpendicular to line segment PQ.

Follow each step carefully. Use a clean sheet of paper.

Step 1: Draw line segment *PQ*.

Draw a point M not on \overline{PQ} . P • () **Step 2:** Place the compass anchor on *M* and draw М an arc that crosses \overline{PQ} at two points. • Q **Step 3:** Place the compass anchor on one of Μ the points and draw an arc below \overline{PQ} . Q **Step 4:** Keeping the same compass opening, place Μ the compass anchor on the other point and draw another arc that crosses the first arc. Label the point where the two arcs cross Q as N. Then draw the line segment MN. \overline{MN} is **perpendicular** to \overline{PQ} . **Check Your Understanding** G Draw a line segment HI and a point G above the line segment. Using a compass and straightedge, construct

H •

a line segment from point G that is perpendicular to HI.