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.

**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 \( AB \), and label it as \( P \).

**Step 2:** Place the compass anchor on \( P \), and draw an arc that crosses \( AB \). 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 \( AB \). Label the point where the arc crosses the segment as \( D \).

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

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

Label the point where the two arcs cross as \( Q \).

**Step 4:** Draw \( QP \).

\( QP \) is perpendicular to \( AB \).

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Check Your Understanding

Draw a line segment. Draw a point on the segment and label it as \( R \).

Use a compass and straightedge. Construct a line segment through point \( R \) that is perpendicular to the segment you drew.

Use a protractor to check that the segments are perpendicular.
**Constructing a Perpendicular Line Segment (Part 2)**

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 $PQ$.

**Step 2:** Place the compass anchor on $M$ and draw an arc that crosses $PQ$ at two points.

**Step 3:** Place the compass anchor on one of the points and draw an arc below $PQ$.

**Step 4:** Keeping the same compass opening, place the compass anchor on the other point and draw another arc that crosses the first arc.

Label the point where the two arcs cross as $N$. Then draw the line segment $MN$.

$MN$ is perpendicular to $PQ$.

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**Check Your Understanding**

Draw a line segment $HI$ and a point $G$ above the line segment. Using a compass and straightedge, construct a line segment from point $G$ that is perpendicular to $HI$. 

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