The tool we’ll use to measure angles is called a protractor. To use a protractor, place the center notch of the protractor at the vertex of the angle, align the protractor so that the 0° mark lies on top of one of the sides of the angle. The location of the angle’s other side on the protractor corresponds to its degree measure.

Using a protractor, what is the measure (to the nearest degree) of the angle shown above?

In the figure above, \( \angle ABD \cong \angle DBC \). If \( m\angle ABD = 5x - 1 \) and \( m\angle ABC = 9x + 11 \), find \( x \) and \( m\angle ABC \).
Construction #1: Construct a line segment congruent to a given line segment.

Given: line segment $\overline{AB}$ and line $\ell$ containing point $P$.
Construct: line segment $\overline{PQ}$ on $\ell$ such that $\overline{AB} \cong \overline{PQ}$.

(remember, we’re not allowed to use a ruler to measure the line segment!)

Technique:
- Use points of compass to “record” length of segment $\overline{AB}$
- Place pivot of compass at $P$, draw arc intersecting $\ell$
- Label intersection point $Q$.

Construction #2: Construct the midpoint of a given line segment congruent.

Given: line segment $\overline{AB}$
Construct: point $M$ on $\overline{AB}$ such that $AM = MB$.

Technique:
- Open compass greater than one-half the length of $\overline{AB}$
- Draw two arcs, one with pivot at $A$, the other with pivot at $B$, so that the arcs intersect one another at two points $P$ and $Q$, one above and one below the segment.
- Use straightedge to draw segment $\overline{PQ}$.
- Label point $M$, the intersection point of $\overline{AB}$ and $\overline{PQ}$. 