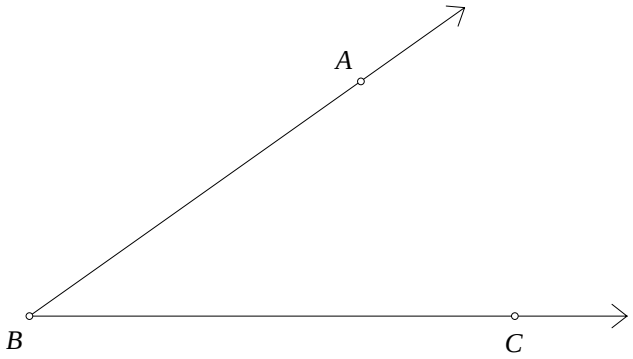
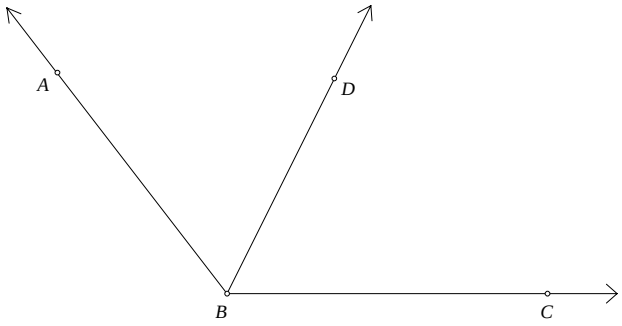
Principles of Geometry HO Section 1.2



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 ℓ containing point *P*.

Construct: line segment $\overline{PQ}$ on ℓ 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 ℓ
- 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 $\overline{PQ}$.