

Geometry 1.4

Measure and classify angles

Identify and use congruent angles

Identify and use angle bisectors

activity: constructions

You will need a protractor and compass today

bisector

ray

opposite rays

angle

side

vertex

interior

exterior

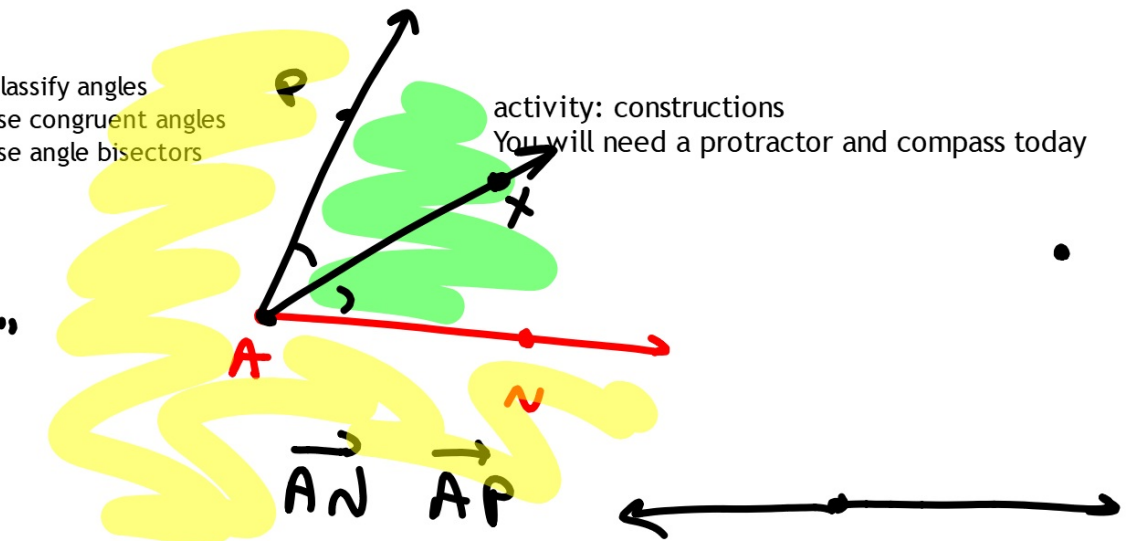
degree

right angle

acute angle

obtuse angle

angle bisector



$\frac{1}{360}$ th of a circle

90°

$< 90^\circ$

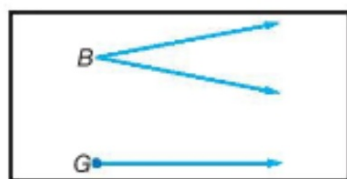
$90^\circ \leftrightarrow 180^\circ$

divides into $\approx$

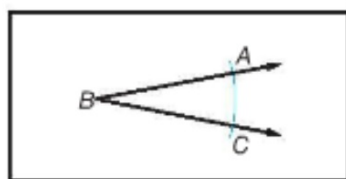
Construction Copy an Angle



Step 1 Draw an angle like $\angle B$ on your paper. Use a straightedge to draw a ray on your paper. Label its endpoint G .



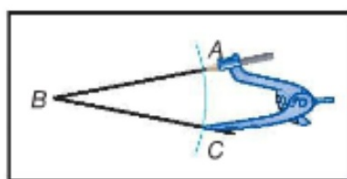
Step 2 Place the tip of the compass at point B and draw a large arc that intersects both sides of $\angle B$. Label the points of intersection A and C .



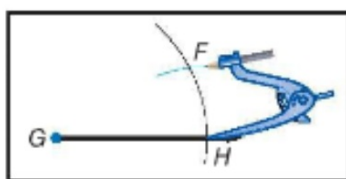
Step 3 Using the same compass setting, put the compass at point G and draw a large arc that starts above the ray and intersects the ray. Label the point of intersection H .



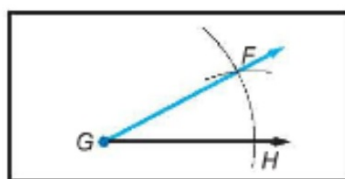
Step 4 Place the point of your compass on C and adjust so that the pencil tip is on A .



Step 5 Without changing the setting, place the compass at point H and draw an arc to intersect the larger arc you drew in Step 4. Label the point of intersection F .



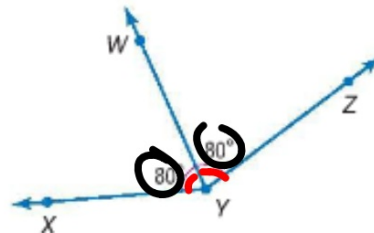
Step 6 Use a straightedge to draw $\overrightarrow{GF}$.
 $\angle ABC \cong \angle FGH$



StudyTip

Segments A line segment can also bisect an angle.

A ray that divides an angle into two congruent angles is called an **angle bisector**. If $\overrightarrow{YW}$ is the angle bisector of $\angle XYZ$, then point W lies in the interior of $\angle XYZ$ and $\angle XYW \cong \angle WYZ$.

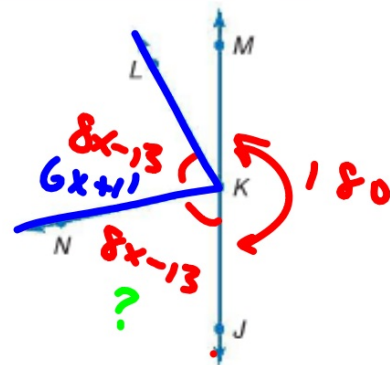


$$m\angle JKN = 83^\circ$$

Example 3 Measure and Classify Angles



ALGEBRA In the figure, $\overrightarrow{KJ}$ and $\overrightarrow{KM}$ are opposite rays, and $\overrightarrow{KN}$ bisects $\angle JKL$. If $m\angle JKN = 8x - 13$ and $m\angle NKL = 6x + 11$, find $m\angle JKN$.



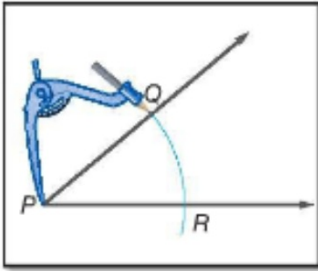
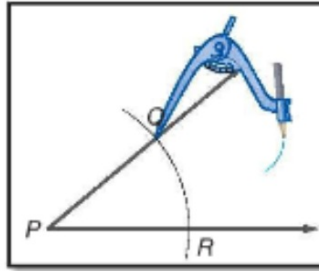
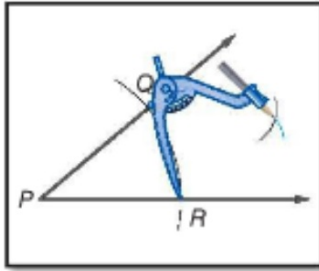
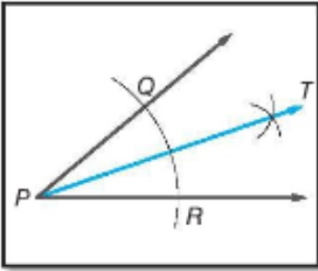
$$\begin{array}{r} 8x - 13 = 6x + 11 \\ -6x + 13 \quad -6x + 13 \\ \hline \end{array}$$

$$\frac{2x}{2} = \frac{24}{2} \quad x = 12$$

$$\begin{array}{l} 8x - 13 \\ 8(12) - 13 \end{array}$$

2 parts

p. 40

 Construction Bisect an Angle 			
Step 1 Draw an angle on your paper. Label the vertex as P. Put your compass at point P and draw a large arc that intersects both sides of $\angle P$. Label the points of intersection Q and R.	Step 2 With the compass at point Q, draw an arc in the interior of the angle.	Step 3 Keeping the same compass setting, place the compass at point R and draw an arc that intersects the arc drawn in Step 2. Label the point of intersection T.	Step 4 Draw $\overrightarrow{PT}$. $\overrightarrow{PT}$ is the bisector of $\angle P$.
			

WB 1.4 prac