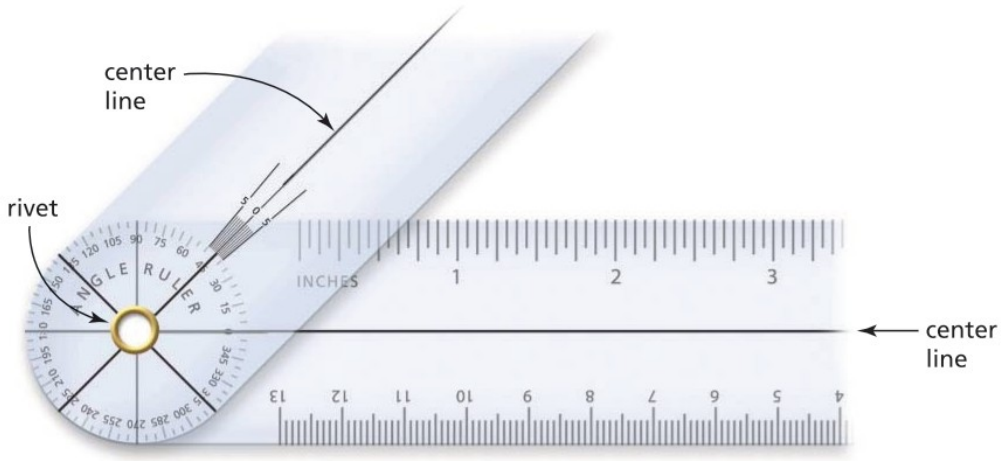
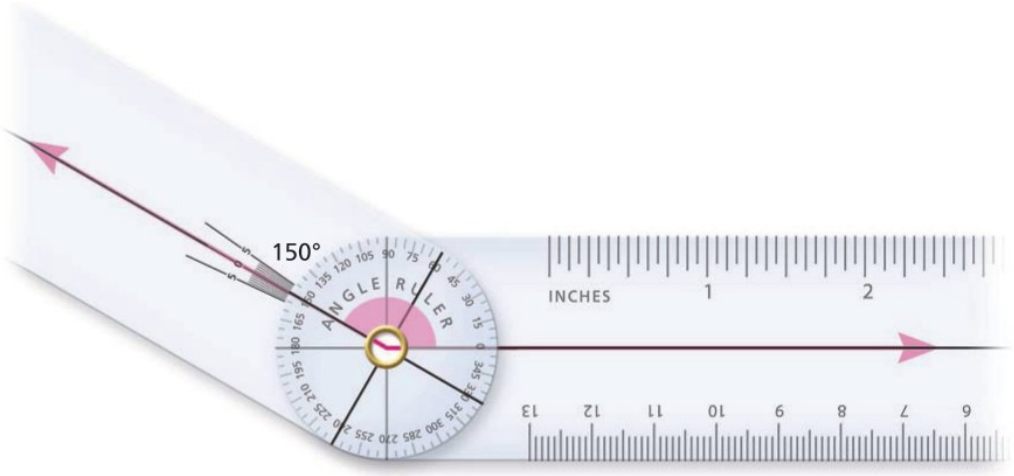
# 1.4 Measuring Angles

One common tool to use for measuring angles is the *angle ruler*. An angle ruler has two arms linked by a rivet. The rivet allows the arms to spread apart to form angles of various sizes. One arm is marked with a circular ruler showing degree measures from 0° to 360°.

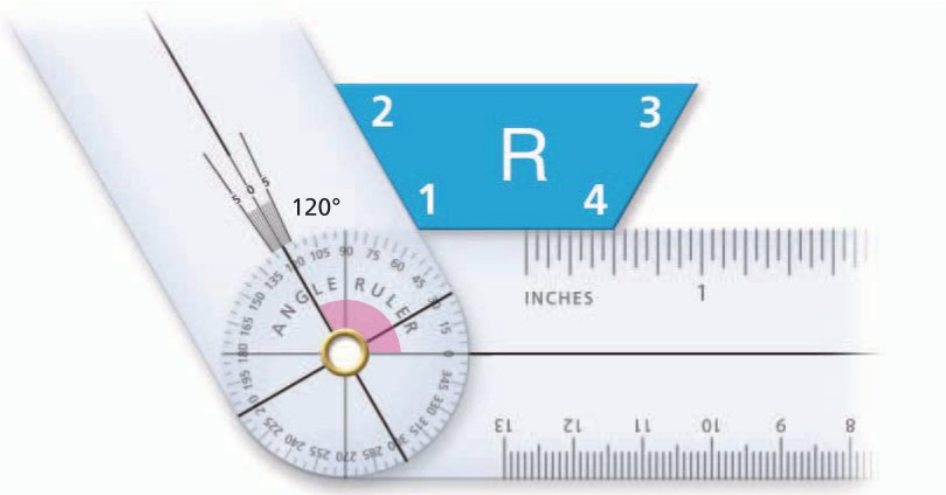



To measure an angle with an angle ruler:

- First place the rivet over the vertex.
- Set the *center line* of the arm marked as a ruler on the first side of the angle.
- Swing the other arm counterclockwise until its center line lies on the second side of the angle.
- Read the angle measure on the circular ruler.



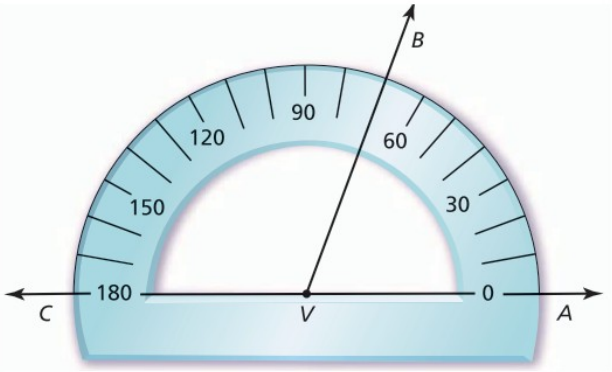
When you use an angle ruler to measure a polygon in the Shapes Set or another object, place the object between the two arms of the angle ruler.




Read the size of the angle, Angle 1 measures 120° in shape R.

Then, read the size of the angle. Angle 1 measures 120° in shape R.

Another tool for measuring angles in degrees is the *protractor*. It is usually semi-circular and has a scale in degrees. The protractor below shows how to measure $\angle AVB$.




- What is the measure of $\angle AVB$ in degrees?

Notice in the diagram above that $\angle CVB$ and $\angle AVB$ share a side. Both angles have $\overrightarrow{VB}$ as a side of the angle. Angles that share a side are called *adjacent angles*.

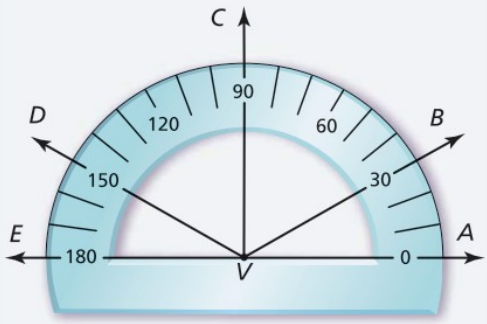
## Problem 1.4

**A** For each polygon shape shown below, *estimate* the measure of each angle. Sketch each figure and label the angles with your estimates.


**B**

1. Use an angle ruler to *measure* each of the angles from Question A.
2. Compare your estimates from Question A with your measurements. If your estimate and measurement differ by more than 10°, measure that angle again and check your work.

**C** Find measures of the angles shown in the diagram.




1. $\angle AVB$
2. $\angle AVC$
3. $\angle AVD$
4. $\angle BVC$
5. $\angle BVD$
6. $\angle CVD$

**D** If the measures of two angles add to 90°, they are called **complementary angles.** If the measures of two angles add to 180°, they are called **supplementary angles.**

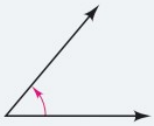
1. Name the pairs of complementary angles in the diagram of Question C.
2. Name the pairs of supplementary angles in the diagram of Question C.

continued on the next page >

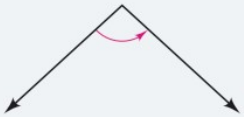
## Problem 1.4 continued

**E** Find the measures of the angles. Use an angle ruler or a protractor.

1.

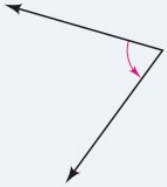


2.



3.

4.



ACE Homework starts on page 24.

## Did You Know?

**The angle ruler's** formal name is *goniometer* (goh nee AHM uh tur). Goniometer is Greek for "angle measurer."

Doctors and physical therapists use goniometers to measure flexibility (range of motion) in knees, elbows, fingers, and other joints.