

## Lesson 1.2: Poolroom Math

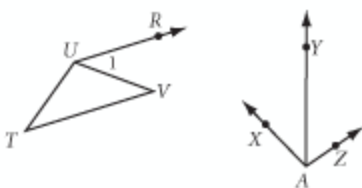
In this lesson you will:

- learn about angles and how to measure them
- identify congruent angles and angle bisectors
- use your knowledge of angles to solve problems involving pool

People use angles every day. Plumbers measure the angle between connecting pipes to make a good fitting. Woodworkers adjust their saw blades to cut wood at just the correct angle. Air traffic controllers use angles to direct planes. And good pool players must know their angles to plan their shots.

\*Add “angle,” “measure of an angle,” “reflex measure of an angle,” and “angle bisector” to your dictionary.

•Example 1: Name all the angles in these drawings.

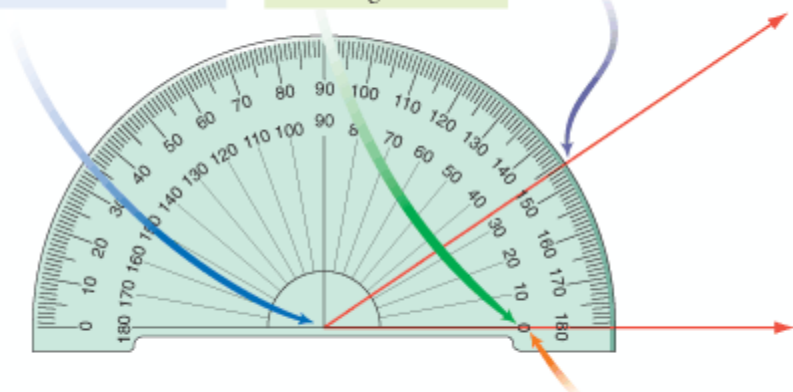


The geometry tool you use to measure an angle is a protractor. Here's a reminder on how to use it.

**Step 1:** Place the center mark of the protractor on the vertex.

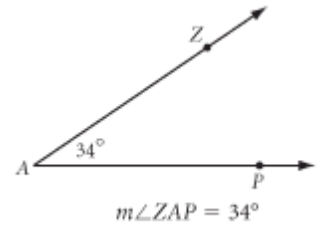
**Step 2:** Line up the 0-mark with one side of the angle.

**Step 3:** Read the measure on the protractor scale.

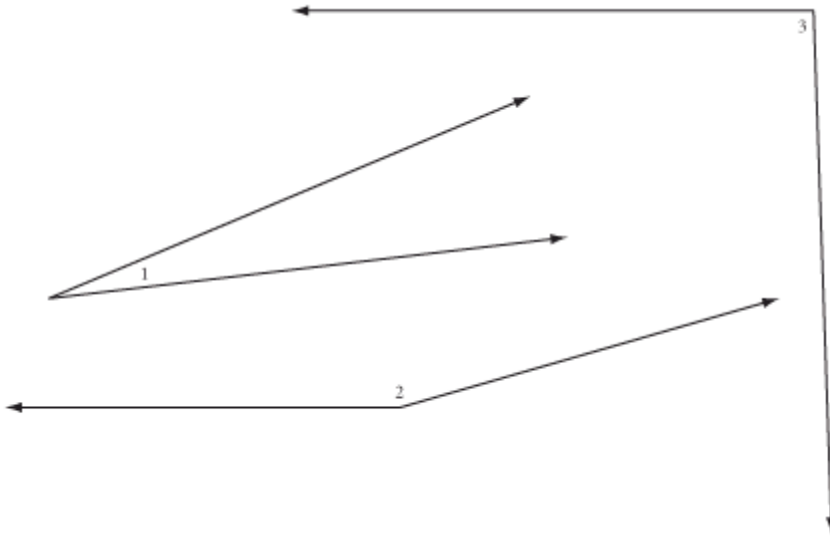


**Step 4:** Be sure you read the scale that has the 0-mark you are using! The angle in the diagram measures  $34^\circ$  and not  $146^\circ$ .

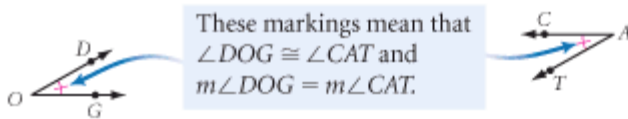
To show the measure of an angle, use an \_\_\_\_\_ before the angle symbol. For example,  $m\angle ZAP = 34^\circ$  means the measure of  $\angle ZAP$  is 34 degrees.



•Example 2: Use your protractor to measure these angles as accurately as you can. Which ones measure more than  $90^\circ$ ?

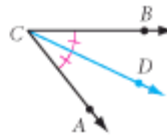


Two angles are congruent if and only if they have equal measure. You use identical markings to show that two angles in a figure are congruent.

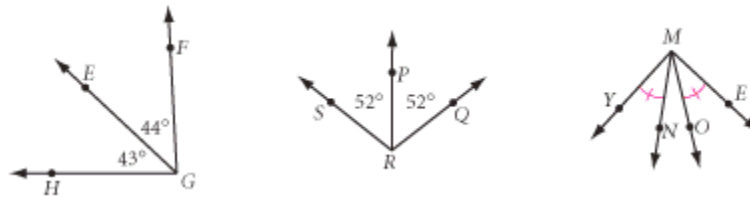


These markings mean that  $\angle DOG \cong \angle CAT$  and  $m\angle DOG = m\angle CAT$ .

$\overline{CD}$  bisects  $\angle ACB$  so that  $\angle ACD \cong \angle BCD$ .



•Example 3: Look for angle bisectors and congruent angles in the figures below.

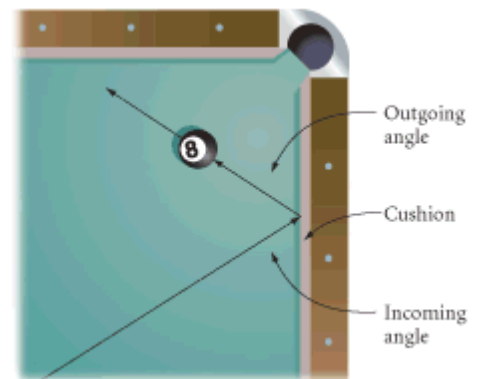


a.) Name each angle bisector and the angle it bisects.

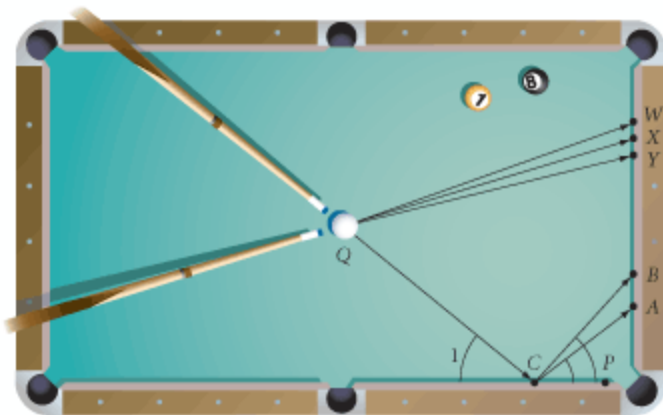
b.) Name all the congruent angles in the figures. Use the congruence symbol and name the angles so there is no confusion about which angle you mean.

### Investigation 1.2: “Virtual Pool”

Pool is a game of angles. When a ball bounces off the pool table’s cushion, its path forms two angles with the edge of the cushion. The **incoming angle** is formed by the cushion and the path of the ball approaching the cushion. The **outgoing angle** is formed by the cushion and the path of the ball leaving the cushion. As it turns out, the measure of the outgoing angle equals the measure of the incoming angle.



Use your protractor to study these shots.



- Use your protractor to find the measure of  $\angle 1$ . \_\_\_\_\_ Which is the correct outgoing angle? Which point—A or B—will the ball hit? \_\_\_\_\_
- Which point on the cushion—W, X, or Y—should the white ball (cue ball) hit so that the ray of the outgoing angle passes through the center of the 8-ball? \_\_\_\_\_
- Compare your results with your group. Make sure everyone agrees.

D.) How would you hit the white ball (cue ball) against the cushion so that the ball passes over the same spot on the way back?

E.) How would you hit the ball so that it bounces off 3 different points on the cushions without ever touching cushion  $\overline{CP}$ ?

⇒ASSIGNMENT: \_\_\_\_\_