Home Connection

In third grade, students learned the parts of circles, and their relationships to the angles within them. Students also classified triangles and quadrilaterals by their angles and side lengths. In 4th grade, students will measure angles in degrees, draw angles with given measurements, and see that angle measures can be added and subtracted.

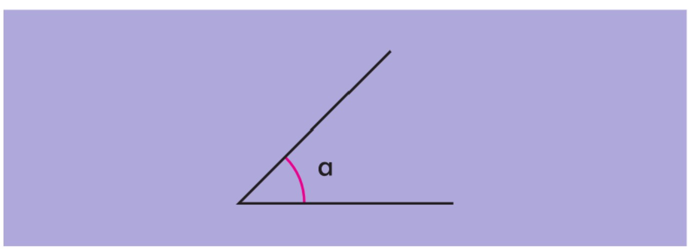
You can model how angles become larger or smaller using some things you might find at home such as opening and closing a pair of scissors, using arms to show angles with your elbows as the vertex, cutting strips of paper and attaching a brad at the vertex, looking at the angles made by the hands on an analog clock, etc.…

Angles

An angle is formed when two lines intersect. The vertex of the angle is the point of intersection. The size of the angle is a measure of the amount of rotation of one side relative to the other side of the angle around the vertex. The length of a side of the angle does not change the angle measure.

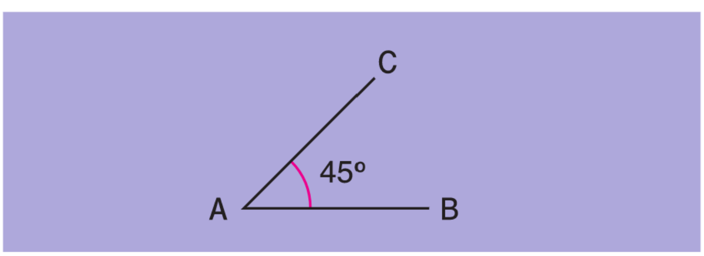
Throughout this chapter, students will use set square tools for measuring common angles of 90˚, 45˚, 60˚, and 30˚.

Arcs are drawn on the inside of angles to show which measurement students should be finding. Many times those angles are named as in the picture below.



The above angle is referred to as < a.

Angles may also be named by labeling a point on each side and the point of intersection as in the picture below.

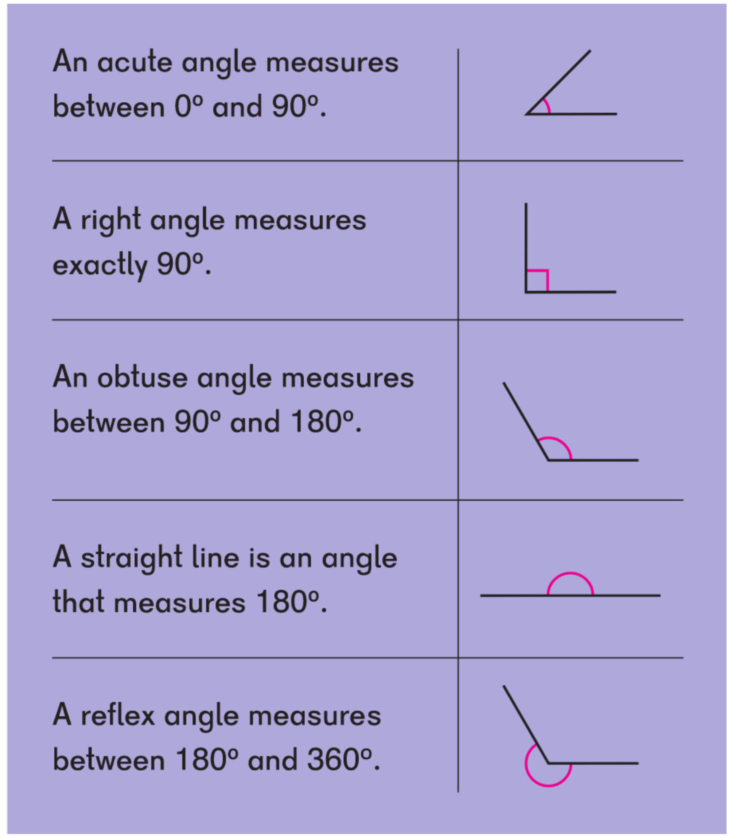


The above angle can be referred to <CAB or <BAC. The vertex point will always be the middle letter.

Measuring Angles

Angles are measured in degrees. Students will learn that there are 360˚ around a circle and 180˚ around half a circle. A quarter turn is 90˚, and a three-quarters turn is 270˚.

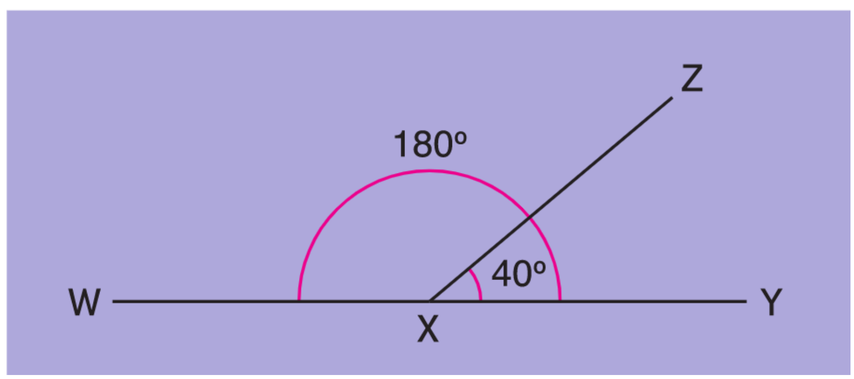
Students will also learn the definition of right, acute, obtuse, and reflex angles.



Adding and Subtracting Angles

Students will add and subtract angle measures. Students will find unknown angles without using a protractor, given the measurement of other angles.

For example:



To find < WXZ, subtract the known amounts to find the unknown angle.

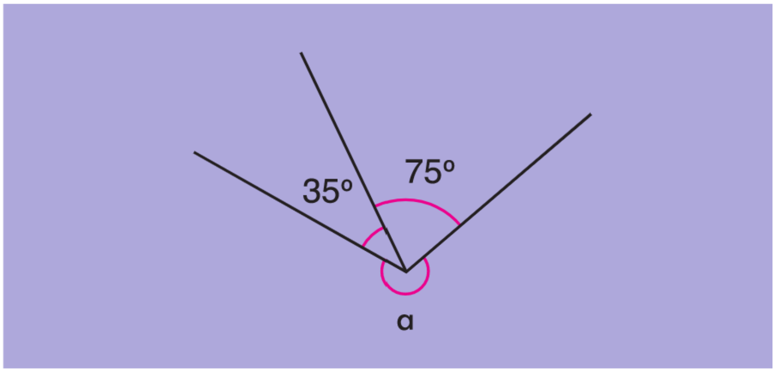
180˚- 40˚ = 140˚

It’s always good to ask your student to reason through what their answer is before they solve. Some questions you might ask:

- What type of angle are we finding? Right, acute, obtuse, or reflex?
- Based on the type of angle it is, what do you already know about the measurement? (Less than 90˚, more than 90˚, more than 180˚, etc..)
- Does your answer make sense?

For example:

Find < a



To find < a:

35˚ + 75˚ = 110˚

360˚ – 110˚ = 250˚

The fact that angles can be added and subtracted is used to measure and draw reflex angles (angles greater than 180˚.)

What Can We Do At Home?

Fun with sidewalk chalk!

(This game is great with sidewalk chalk, but if you're unable to use that, you can use a spinner from a board game instead).

Draw a large circle with sidewalk chalk in your driveway.

Mark a starting point with a dash mark.

Give directions to your child and he or she must walk along the outside of the circle that many degrees. Your directions can get progressively more complicated if your child needs an extra challenge. Each time, have your student begin at the starting dash mark. This will make it easier for them to visualize the angles from where they started to where they ended up. (If using a spinner, have your child move the spinner arm according to your directions.)

Here are some directions you might choose to give:

- *Turn and walk 180˚ to the right*
- *Turn and walk 90˚ to the left*
- *Turn and walk three quarters of the way around the circle to the right. How many degrees did you walk?*
- *Turn and walk about 45˚ counterclockwise (Estimating of course)*
- *Turn and walk about 60˚ degrees clockwise (Estimating of course)*
- *Walk 45˚, now walk another 45˚. How many degrees total have you walked?*
- *Walk clockwise 90˚, now walk counterclockwise 45˚. From where you started to where you are now, how many degrees are there?*
- *Walk clockwise 270˚. Now turn and walk counterclockwise 90˚. What is the angle from where you started to where you are now?*

Then you could switch roles and you can be on the circle, while your child calls out directions for you.