

What Is An Angle?

Before we talk about what an **angle** is, let's talk about some of the parts of an angle. An angle has two sides. Each side is a **ray**. A ray is part of a line, but a ray has a starting point. A line goes on forever in both directions. A ray is usually shown like this:

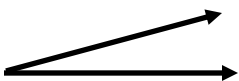


You can see the dot shows the point where the ray starts. The arrow shows that the ray can go on forever in one direction.

The point where the two sides (rays) of the angle come together is called the **vertex**.

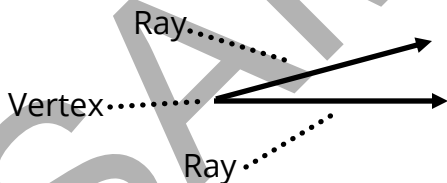
So, now we know an angle is a figure with two sides formed by rays. The rays have the same end point where the rays meet, called the vertex.

Here is a picture of an angle:



When you draw a picture of an angle, you usually do not show the vertex as a point because when the rays come together, you can't see their starting point very well.

Let's look at the parts of an angle:



Begin keeping a notebook of terms and symbols you learn about angles. New terms and symbols in each section are also listed as a review. Copy them into your notebook. You can refer back to them whenever necessary. There is a page at the end of the exercises you can use for your terms and symbols, or you can just use notebook paper, whichever you prefer.

Review:

ray: a part of a line that has a starting point and can go on forever in one direction

vertex: the common point where two rays meet to form an angle

angle: a figure with two sides formed by rays which have the same end point where the rays meet.

To find the size of an angle, which is measured in **degrees**, you can use an instrument called a **protractor**.

If the rays of an angle make a square corner where they meet, the angle is called a **right angle**. A right angle always measures 90° .

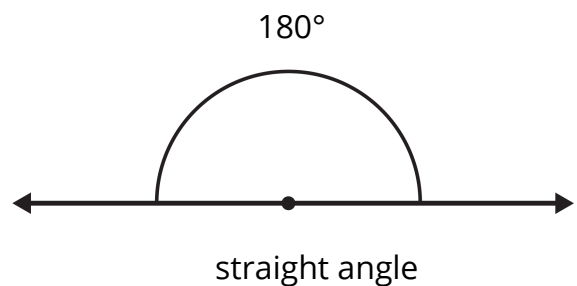
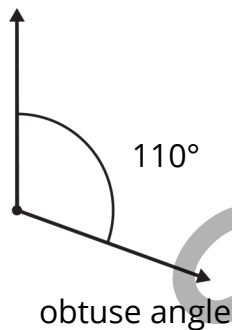
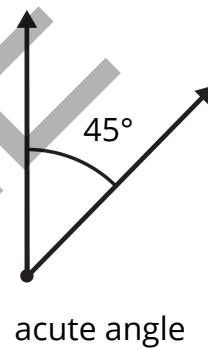
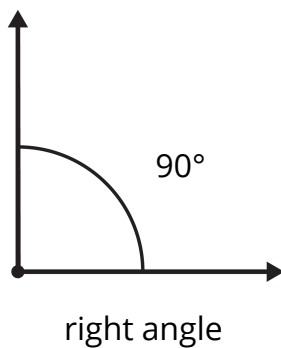
If the rays make an angle that is less than 90° , it is called an **acute angle**.

If the rays make an angle that is more than 90° , but less than 180° , it is called an **obtuse angle**.

If the rays make a straight line, the measurement is 180° , and it is called a **straight angle**.

You can draw a curved line between the two rays to show the angle you are measuring.

Here are examples of angles:



Review:

protractor: instrument for measuring the number of degrees in an angle

degrees: the common measurement used for angles

right angle: an angle in which the rays form a square corner; always measures 90°

acute angle: an angle that measures less than 90°

obtuse angle: an angle that measures more than 90° , but less than 180°

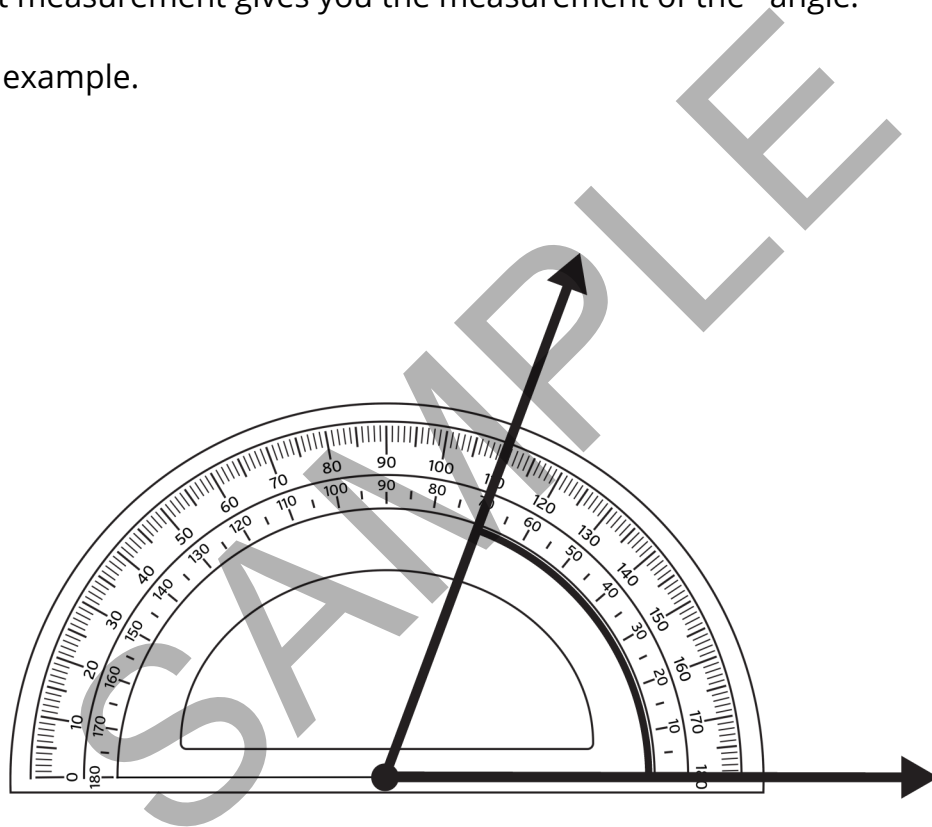
straight angle: an angle that forms a straight line; measures 180°

) curved line drawn between two rays that shows the angle you are measuring

Using a Protractor to Measure an Angle

Look at the picture of a protractor. There are many different types of protractors, but this is a fairly common type. This type of protractor is often made of plastic that you can see through. Sometimes they are clear, and sometimes they are a different color, but you can still see through them. There is a point where a line crosses through a dot on the bottom of the protractor. This dot is placed on the vertex of the angle. The horizontal line that runs through the dot is placed exactly on one of the rays of the angle. Since this protractor is clear, you can easily see that the line on the bottom of the protractor is exactly on the ray. This makes that ray show as 0° . Now, look at where the other ray crosses the protractor. Sometimes, you have to extend the ray to make it long enough to see what the measurement is. If that is necessary, be sure to use a ruler to get a perfectly straight line. Look at the line where the ray crosses the protractor. That measurement gives you the measurement of the angle.

Let's look at an example.

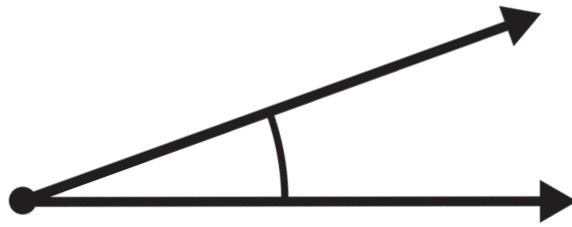


First, the protractor is placed on the vertex of the angle with one ray of the angle along the line on the protractor that places it at 0° . Next, you can look at the place where the other ray crosses the protractor and see that this angle measures 70° .

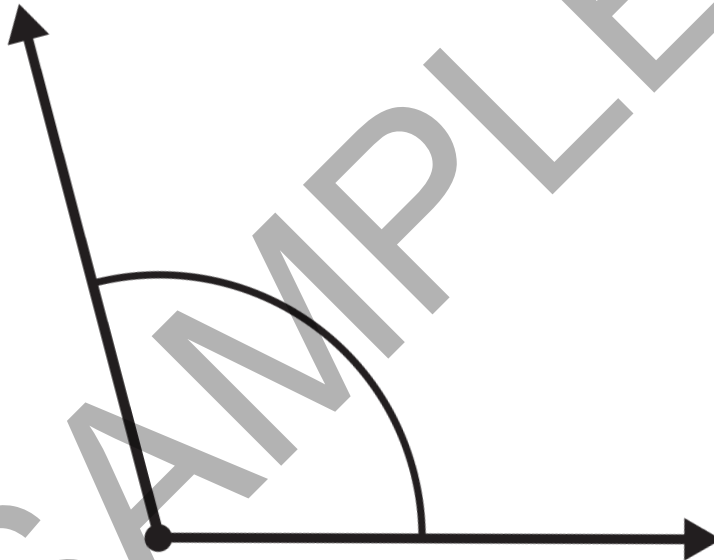
Now, it is your turn. On the following pages are angles. Get out your protractor and measure each angle. Write the measurement by the symbol used to show the measurement of the angle.

Angles to Measure

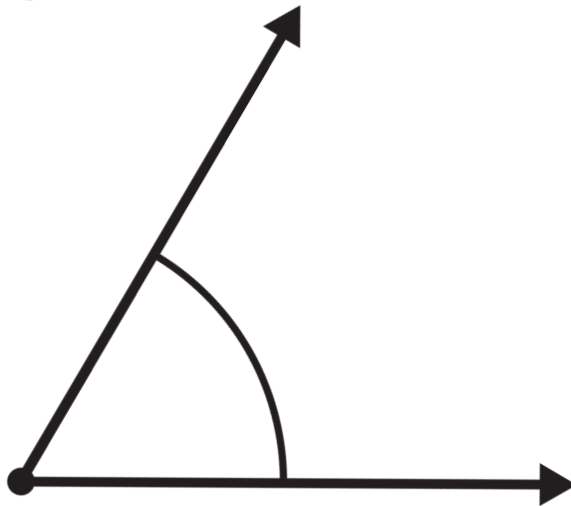
1.



2.



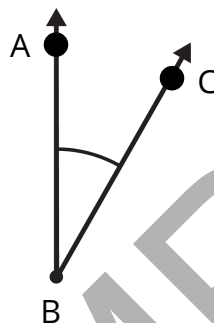
3.



Naming an Angle

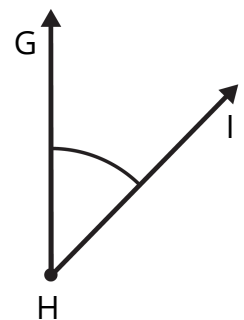
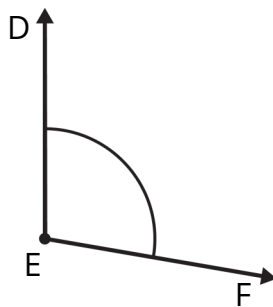
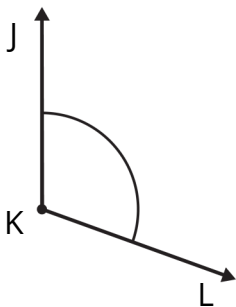
Why should we name an angle? Well, if I were to tell you to measure the angle below, how would you know which angle I was talking about? I could tell you to measure the acute angle below, but there are two of them. I could tell you to measure the obtuse angle below, but there are two of them also. It is much easier to have a way to name the angle. Should we call one Fred and one Sam? Maybe Nora and Terry? Of course that is just being silly. So, how do you name an angle?

The rays that make the sides of an angle are basically made of points. So, to name an angle, you pick a point near the end of the ray. The point is given a letter name using an uppercase letter. We do the same for the other ray in the angle. Then, we give the point that is the vertex an uppercase letter name. See the example below (the points are enlarged in the example). The letter that names the vertex is always the middle letter.



This angle is angle ABC or angle CBA.
The symbol for angle is \sphericalangle .
So, the angle is named $\sphericalangle ABC$ or $\sphericalangle CBA$.

Look at the angles below. Draw a circle around $\sphericalangle DEF$. Make a square around $\sphericalangle GHI$. Make an X on $\sphericalangle JKL$.

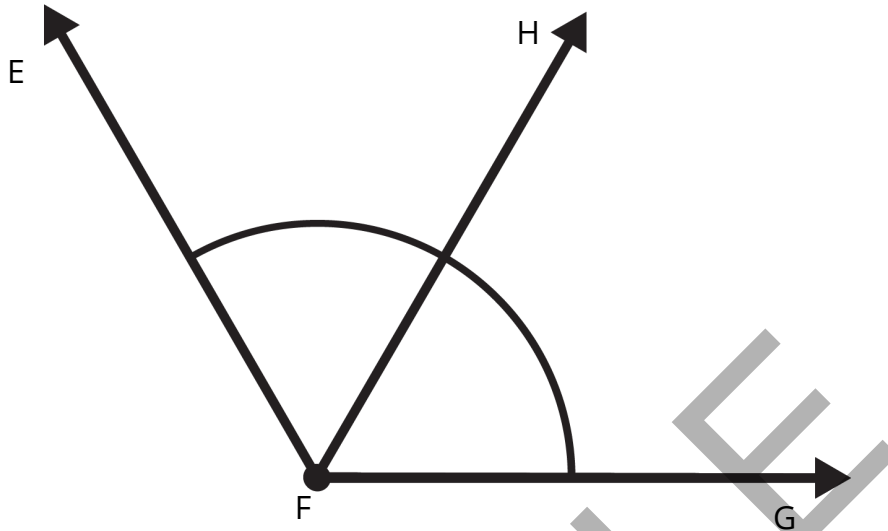


Review:

\sphericalangle Symbol for angle

Review: Part 4

See $\angle EFG$ below. It measures 120° . Ray FH bisects $\angle EFG$. Answer the questions that follow the figure.



1. Name the two congruent adjacent angles in the figure above.
2. Name the angle bisector.
3. What is the measurement of each of the angles made by bisecting $\angle EFG$?
4. What is the vertex of each of the angles made by bisecting $\angle EFG$?
5. What is the name of the ray shared by each of the angles made by bisecting $\angle EFG$?
6. How many angles are in the figure above? Name them.