

# Geometry, You Can Do It !

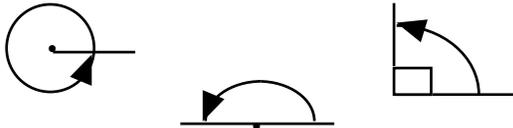
## Angles

by Bill Hanlon

What's the secret for doing well in geometry? Knowing all the angles.

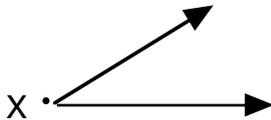
An angle can be seen as a rotation of a line about a fixed point. In other words, if I were to mark a point on a paper, then rotate a pencil around that point, I would be forming angles.

One complete rotation measures  $360^\circ$ . Half a rotation would then measure  $180^\circ$ . A quarter rotation would measure  $90^\circ$ .



Let's use a more formal definition. An **angle** is the union of two rays with a common endpoint.

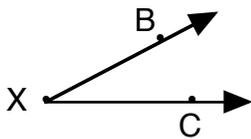
The common endpoint is called the **vertex**. Angles can be named by the vertex.



That angle is called angle X, written mathematically as  $\angle X$ .

The best way to describe an angle is with three points. One point on each ray and the vertex always in the middle.

That angle could be described in three ways :  $\angle X$ ,  $\angle BXC$ , or  $\angle CXB$ .

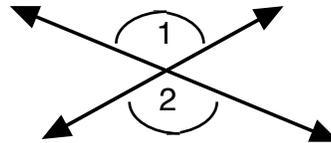


We classify angles by size. **Acute** angles are angles less than  $90^\circ$ . In other words, not quite a quarter rotation. **Right** angles are angles whose measure is  $90^\circ$ . An **obtuse** angle is greater than  $90^\circ$ , but less than  $180^\circ$ . That's more than a quarter rotation, but less than a half turn. And finally, **straight** angles measure  $180^\circ$ .

We also study angle pairs. We call two angles whose sum is  $90^\circ$  **complementary** angles. For instance, if  $\angle P = 40^\circ$  and  $\angle Q = 50^\circ$ , then  $\angle P$  and  $\angle Q$  are **complementary** angles.

Two angles whose sum is  $180^\circ$  are called **supplementary** angles.

Vertical angles are formed by intersecting lines.



$\angle 1$  and  $\angle 2$  are a pair of vertical angles.

The mathematical definition of **vertical** angles is: two angles whose sides form pairs of opposite rays.

As we study geometry, we will use many terms that will be new to you. By knowing them and being able to picture them, that will make your study a great deal easier.

Vocabulary is power !