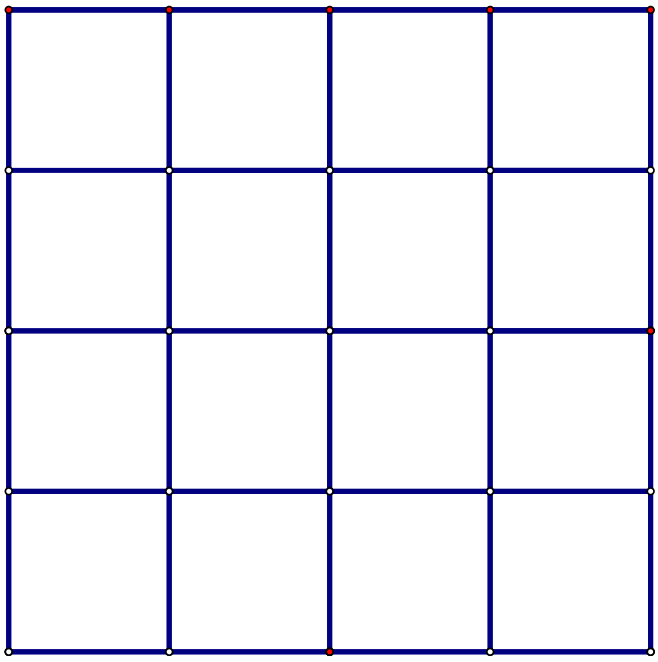
Lesson 1-1 - Getting Started

Welcome to Honors Geometry and your class notes! Let's start with a warmup…see how you do – I don't expect that you'll get the last one, but you probably can get the first 3 questions!

How many squares are there in the 4 X 4 square shown in the diagram?



How many squares are there in a 5 X 5 square?

How many squares are there in a 6 X 6 square?

How many squares are there in a n X n square?

Today, we got ourselves going by looking at the three "Building Blocks of Geometry" that the crazy Greeks (Plato, Pythagoras, Euclid, et. al.) came up with some 3,000 years ago. These are points, lines, and planes:

A *point* is the basic unit of geometry. It has no size, only location.

Points are always represented by a capital letter.

A line is a straight arrangement of points. It has infinite length but no thickness.

You name a line by naming two points on the line. The line above would be represented as $\overleftrightarrow{AB}$ or $\overleftrightarrow{BA}$.

A *plane* has length and width, but no thickness

We discussed the fact that all of Euclidean geometry (that which we'll be studying this year) is derived from these three building blocks. From there, we started to develop our database of geometric terms, starting with a segment.

A *line segment* (or simply *segment*) consists of two points and all the points between them that lie on the line containing the two points. A segment is just like a line except that it has a definite beginning and end.

If the two points are A and B, then the segment between them can be represented by $\overline{AB}$ or $\overline{BA}$.

The two points are called the *endpoints* of the line segment.

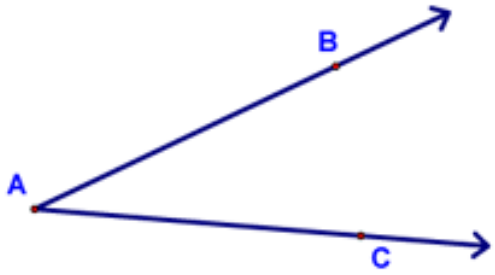
We then defined rays and angles. Make sure that you get down the symbology (how we write them symbolically) of these as well as the definitions!

A *ray* is the part of a $\overleftrightarrow{AB}$ that contains point *A* and all the points on $\overleftrightarrow{AB}$ that are on the same side of point A as point B. A ray differs from a line or segment in that it begins at an endpoint and then extends infinitely far in only one direction.

You need two letters to describe a ray, the first being the endpoint and the second being any other point the ray passes through.

Ray AB may be written symbolically as $\overrightarrow{AB}$.

If point Y is another point that the ray passes through, it may also be referred to as $\overrightarrow{AY}$. However, $\overrightarrow{AB}$ is different than $\overrightarrow{BA}$.

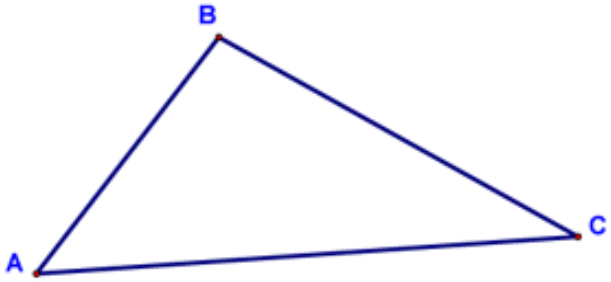


An *angle* is two rays that share a common endpoint.

The common endpoint of the two rays is called the *vertex* of the angle, and the two rays are called the *sides* of the angle.

You must use three letters to represent an angle, with the middle one being the vertex. Sybolically, we represent angle *BAC* as $\angle BAC$ or $\angle CAB$.

Finally, we talked about the union and the intersection of various geometric figures. Make sure that you can do problems that incorporate these concepts!



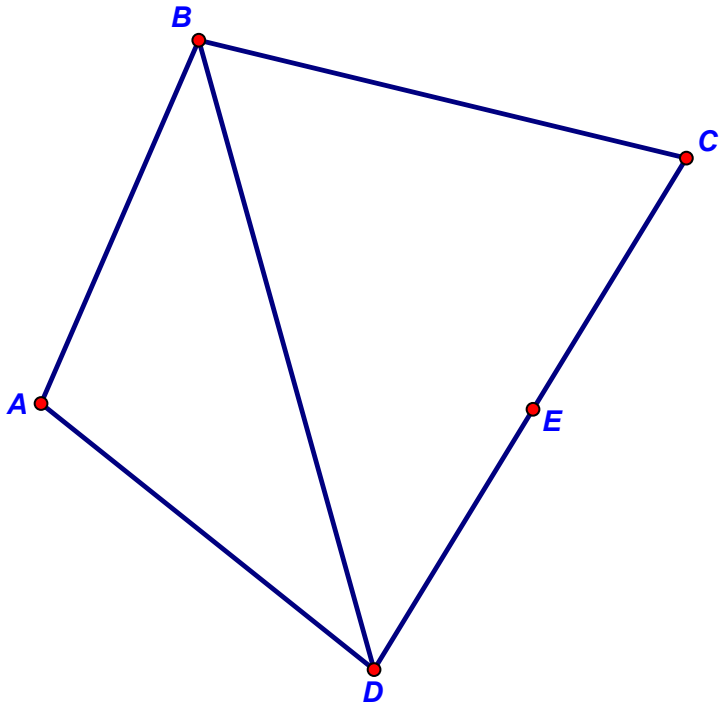
A triangle has three segments as it's sides. The triangle is the *union* ($\cup$) of three segments.

$$\triangle ABC = \overline{AB} \cup \overline{BC} \cup \overline{AC}$$

The *intersection* ($\cap$) of any two sides is a *vertex* of the triangle.

$$\overline{AB} \cap \overline{BC} = B$$

Let's end with a practice problem using unions and intersections. See if you can answer these questions!



$\overleftrightarrow{AB} \cap \overleftrightarrow{BD} =$

$\overline{AB} \cap \overline{DC} =$

$\overrightarrow{AB} \cup \overrightarrow{AD} =$

$\overrightarrow{DE} \cup \overrightarrow{EC} =$