Naming simple geometric figures

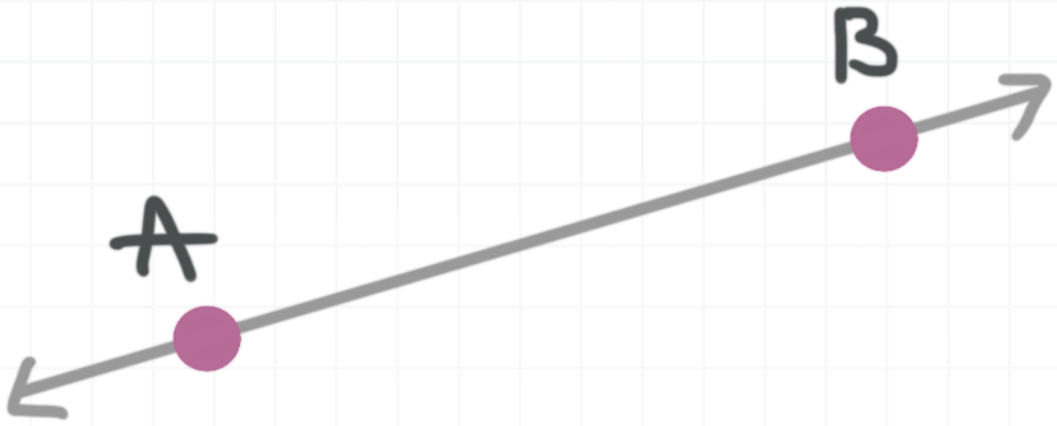
In this lesson we'll look at basic geometric figures like points, lines, line segments, rays, and angles, and we'll talk about how to name them.

Points

A **point** is a specific location in space. A point is usually named with a single letter, and it's represented by a dot. Point A might look like this:

Lines

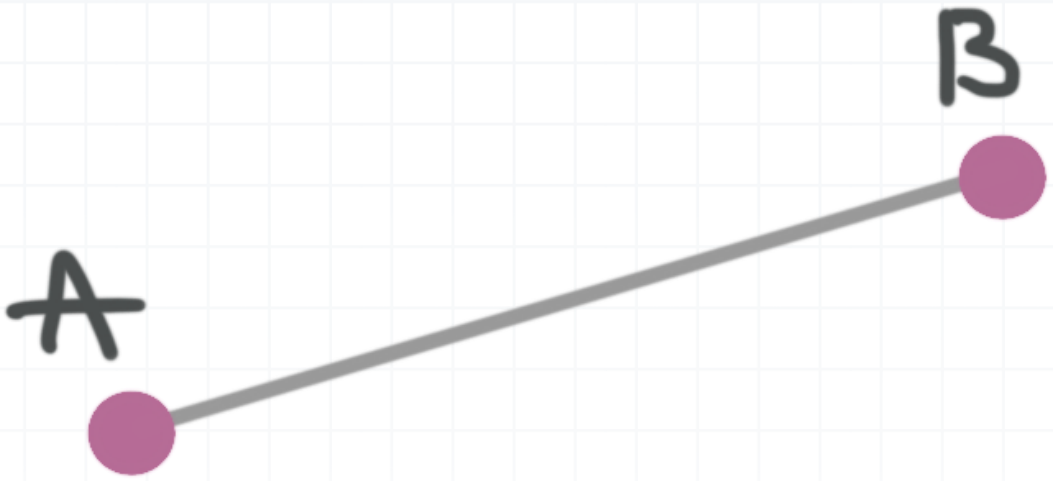
A **line** extends to infinity in two opposite directions, so it can be thought of as the straight path that connects two points (and extends beyond each of them, to infinity). A line is usually named with two letters that represent two points on the line, with an arrow drawn over them that points in both directions to indicate that the line extends forever in both directions. A drawing of a line needs to be straight and have arrows on both ends. Line $\overleftrightarrow{AB}$ (also called line $\overleftrightarrow{BA}$), might look like this:



A line can also be named with a lowercase letter. Line p might look like this:

Line segments

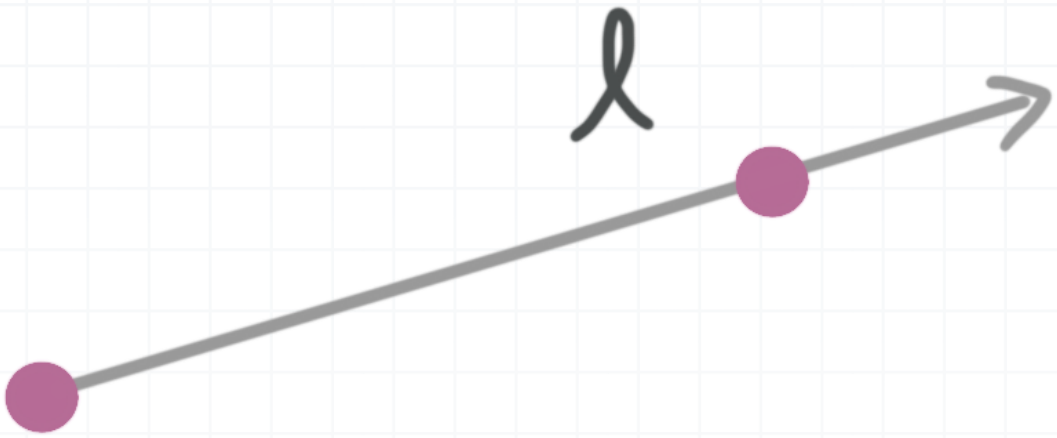
A **line segment** is a finite piece of a line. In other words, line segments don't extend infinitely in both directions, unlike a line. The points at the ends of a line segment are called endpoints. You name a line segment by its endpoints, with a line (but no arrow) over them. Line segment $\overline{AB}$ might look like this:



Rays

Another type of "partial line" a line is a **ray**. A ray is a part of a line that has one endpoint, and one side that goes on to infinity in the direction that doesn't include the endpoint. We name a ray with its endpoint and any other point on the ray, with a one-sided arrow over the two letters that points in the direction away from the endpoint. Ray $\overrightarrow{AB}$ might look like this:

A ray can also be named with a lowercase letter. Ray l might look like this:

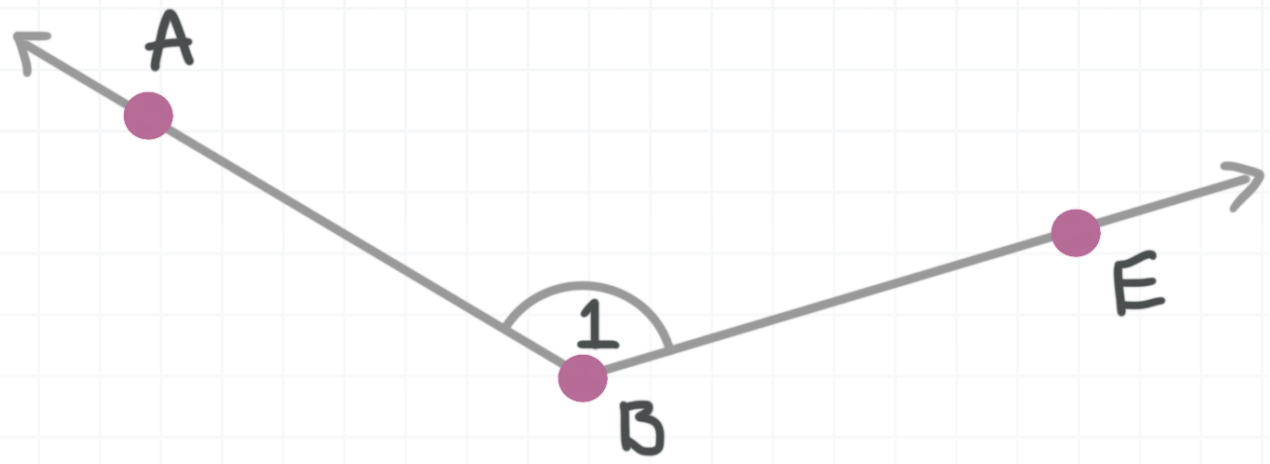


Angles

When two rays have a common endpoint, they form an angle. The common endpoint of the angle is called the vertex. These are ways to name angles:

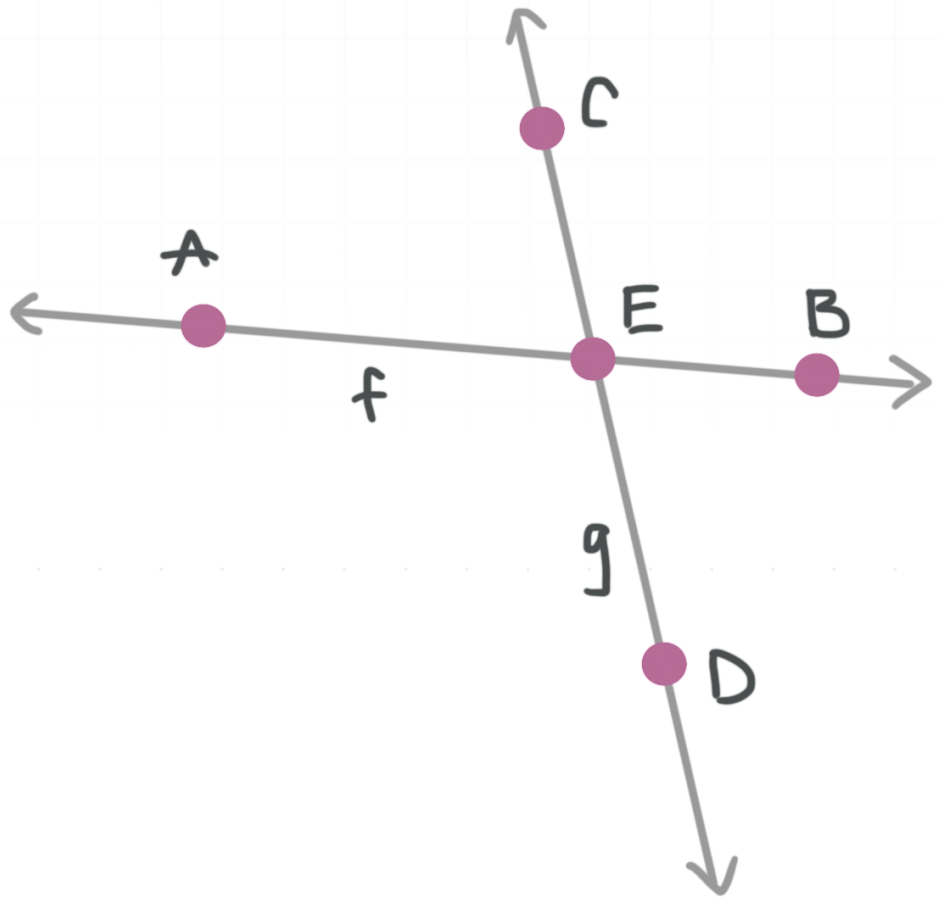
1. Writing the **angle symbol** $\angle$ and then the name of the vertex.
2. Writing the angle symbol and then three letters: the name of some point on one ray, the name of the vertex, and the name of some point on the last ray.
3. You can also name an angle with a lowercase letter or number. If the lowercase letter or number is written inside the angle, then you write the name of the angle inside the angle.

If you choose method 2, be sure to put the name of the vertex in the middle of the name! Here's an angle that can be named in any of four ways: $\angle B$ or $\angle ABE$ or $\angle EBA$ or $\angle 1$.



Example

What does the letter f represent in the diagram?

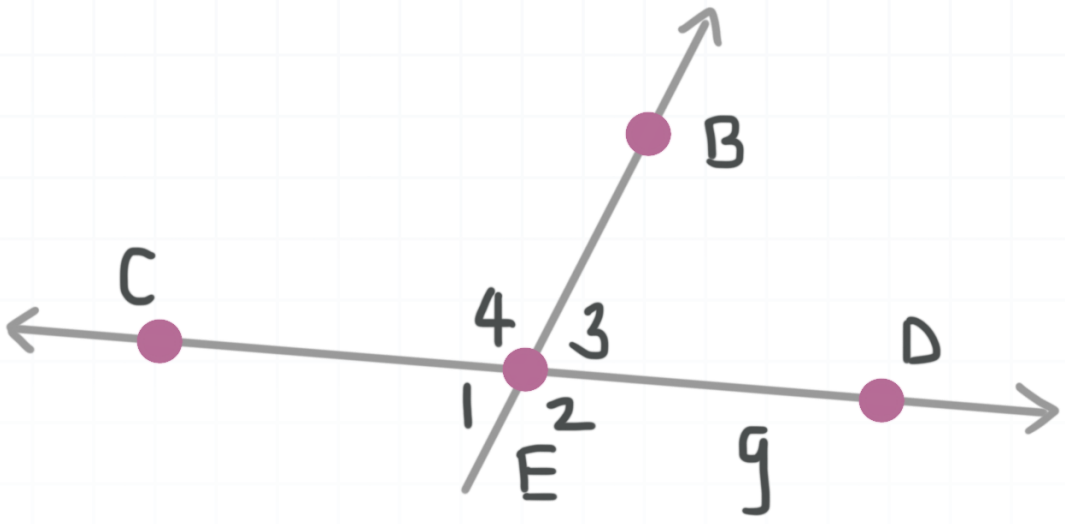


The letter f represents a line. That line could also be called line $\overleftrightarrow{AB}$ or line $\overleftrightarrow{BA}$.

Let's look at naming angles.

Example

What are three other names for $\angle 4$? Are any of the names a bad choice? Why or why not?



E is the vertex of $\angle 4$, so it can be named $\angle E$, $\angle CEB$, or $\angle BEC$. In this case $\angle E$ would be a bad choice for the name, because E is also the vertex of angles 1, 2, and 3.

Let's try an example where we identify geometric figures by the symbols used in naming them.

Example

Match the symbol on the left with the name of the figure on the right.

A	An angle

$\overrightarrow{AB}$	A point
$\overleftrightarrow{EF}$	A line
$\angle E$	A line segment
$\overline{JI}$	A ray

Remembering what type of geometric figure each symbol represents can go a long way toward helping us interpret and solve geometry problems. We'll rearrange the column on the right so that the name of each figure corresponds to the correct symbol in the column on the left.

A	A point
$\overrightarrow{AB}$	A ray
$\overleftrightarrow{EF}$	A line
$\angle E$	An angle
$\overline{JI}$	A line segment