Understanding Geometric Concepts

Geometric lines are found all around us. In this unit, we will examine parallel lines, perpendicular lines, skew lines, line segments, rays, and angles. The three angles in a triangle share a special relationship. We will explore this special connection. We will examine line segments, paths, and congruency. We will work with pattern blocks to discover some geometric math properties and also have fun creating some beautiful geometric designs.

Geometry Vocabulary

Sum of Angles in a Triangle

Paths

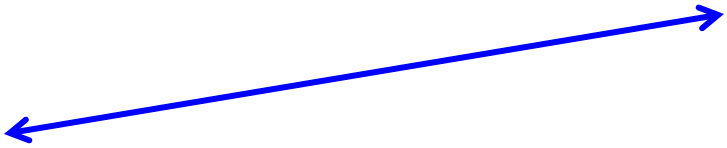
Congruent Shapes and Pattern Blocks

Pattern Blocks

Geometry Vocabulary

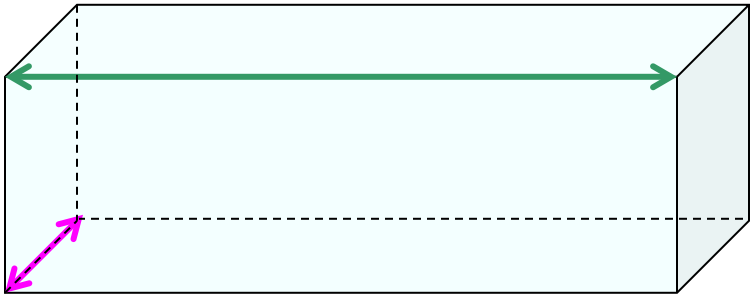
Here are some terms to know in the study of geometry.

line – a straight path that goes in two directions without end.



segment – a part of a line with two endpoints

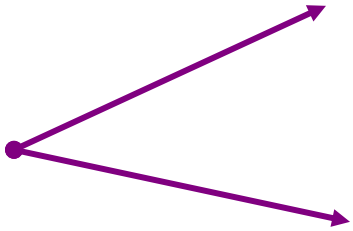
skew lines – lines in space that do not intersect and are not parallel



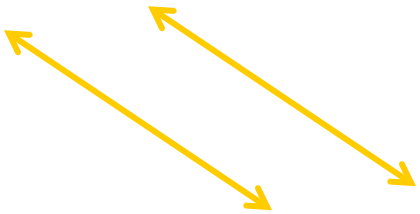
The two lines highlighted above will never intersect and are not parallel. They are skew lines.

ray – a part of a line that has one endpoint and continues in one direction without end

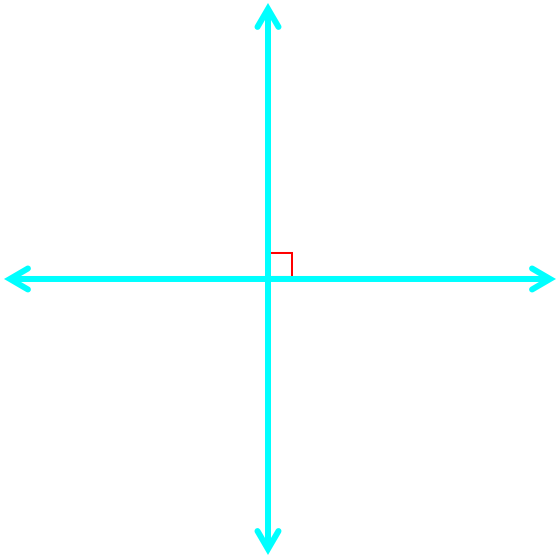
angle – a figure formed by two rays that share a common endpoint called the vertex



parallel lines – lines the lay in the same plane (flat surface) and never intersect.



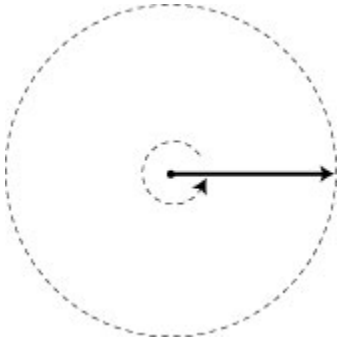
perpendicular lines – lines that intersect (cross each other) and form right angles (90 degrees) at the point of intersection



Sum of Angles in a Triangle

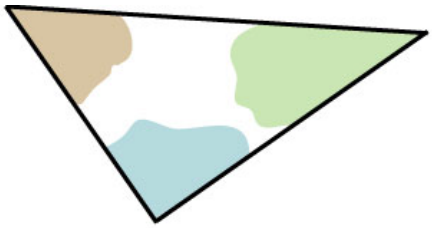
Special Angles

180° angle

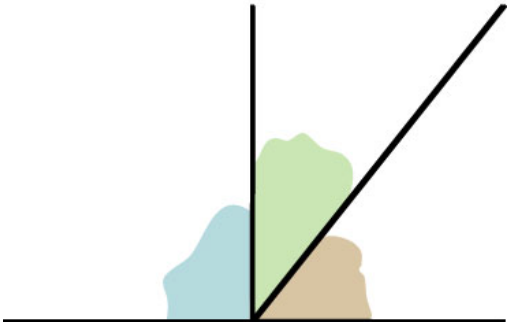


360° angle

Look at the angles in the triangle below. Cut the angles away from the triangle.



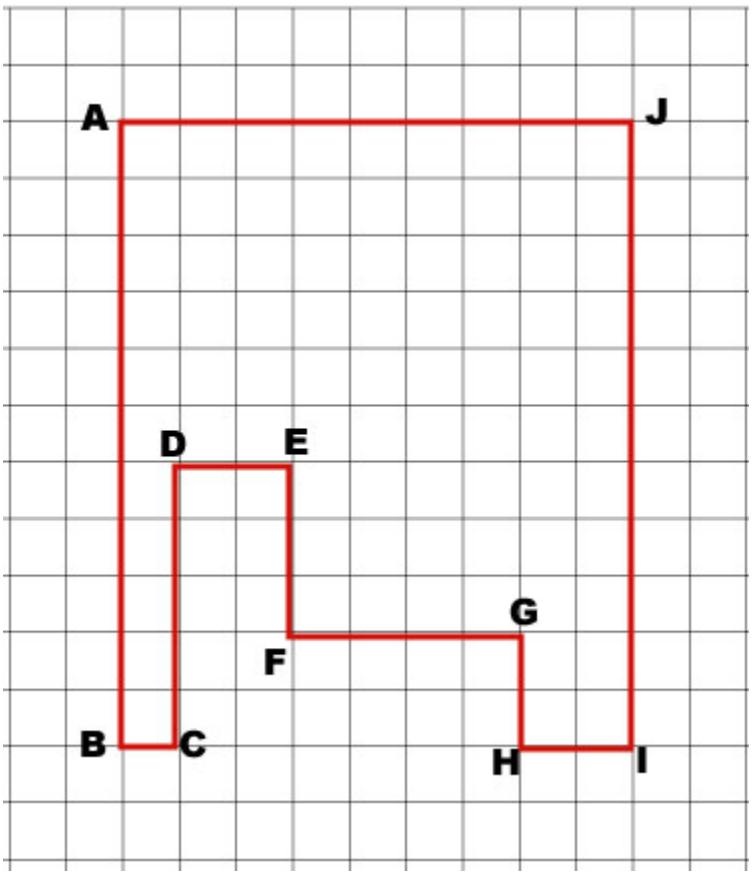
Place the angles side by side at one vertex point, so that there are no gaps between the angles.



The three angles of any triangle together make a 180° angle.

Paths

In the given diagram drawn on the grid below, find all line segments that are the same length. You may use combinations of segments together to equal one length. Use two letters, at the corners of the path, to name the segments.



AB is same length as ?
DE is the same length as HI and also ?
DC is the same length as ? + GH.
AJ is the same length as BC+ ? + ? +HI.
FG is the same length as ? + HI.
EF is the same length as ? + ?

The longest length is ? (also JI).
The shortest length is ?

The answers are provided below. Note: Some questions may have more than one answer.

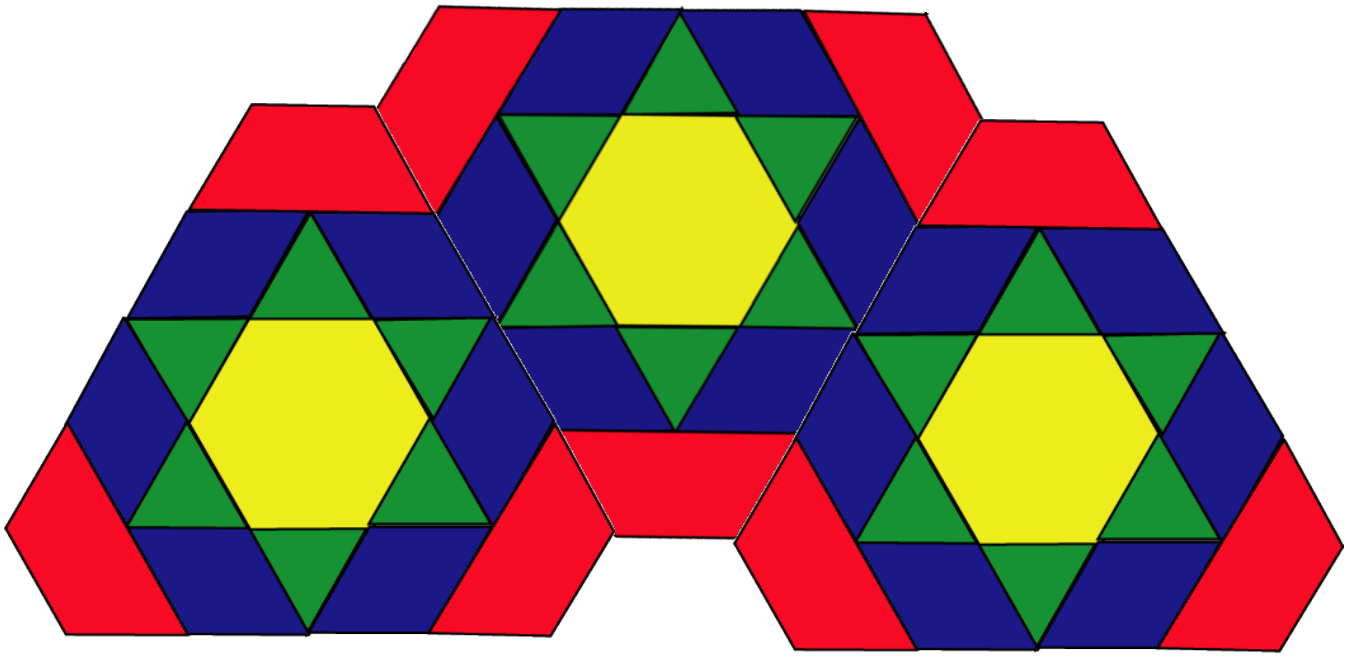
AB is same length as JI.
DE is the same length as HI and also GH.
DC is the same length as EF + GH.
AJ is the same length as BC + DE + FG + HI.
FG is the same length as DE + HI.
EF is the same length as BC + HI.

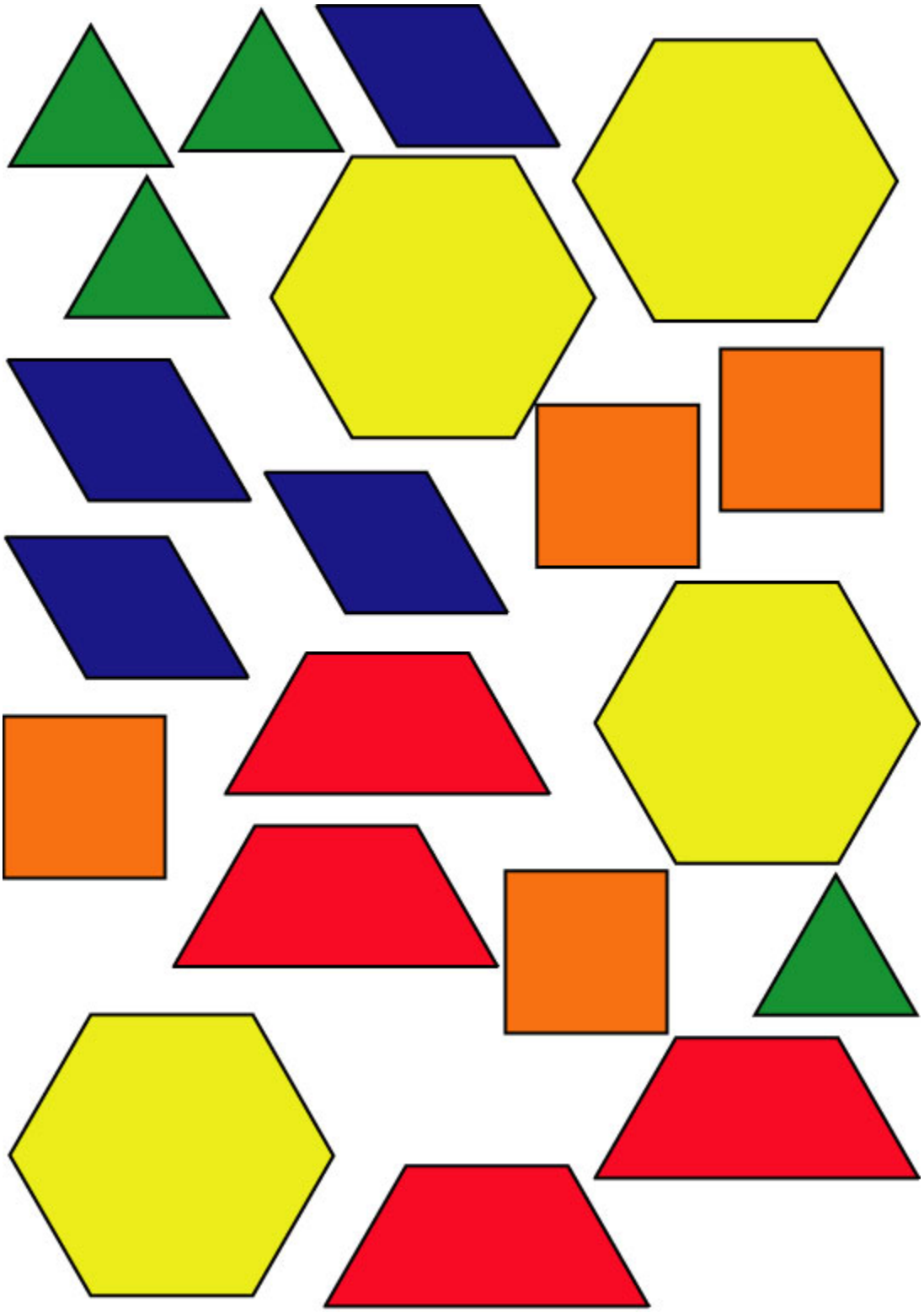
The longest length is AB (also JI).
The shortest length is BC.

Congruent Shapes and Pattern Blocks

Congruent shapes – shapes that are the same size and the same shape.

You can make an endless collection of designs using pattern blocks. Pattern blocks are made up of congruent parallelograms (blue), congruent hexagons (yellow), congruent trapezoids (red) and congruent triangles (green).



Click here to print several copies of "Pattern Blocks", and then cut out the shapes to make your own design.

Pattern Blocks