

Review of Geometry

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or press the enter key

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Topics

Click on the topic that you wish to view . . .

 Lines

 Angles

 Triangles

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Lines

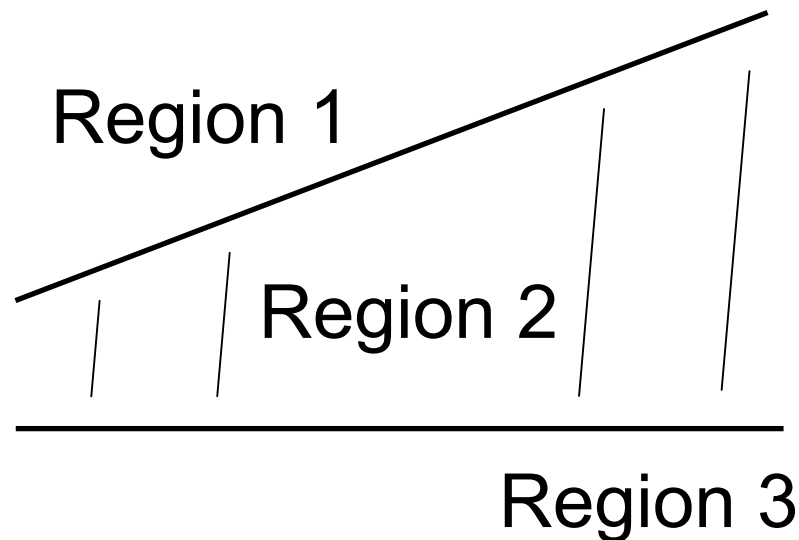
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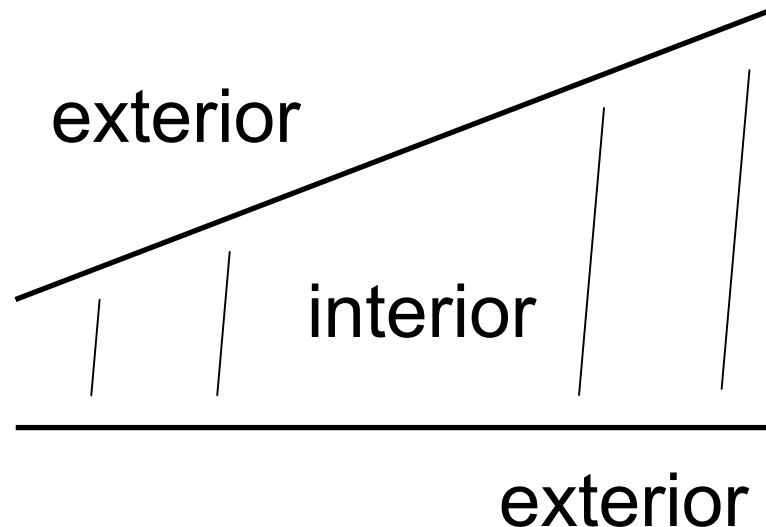
When a pair of lines are drawn, the portion of the plane where the lines do not intersect is divided into three distinct regions.



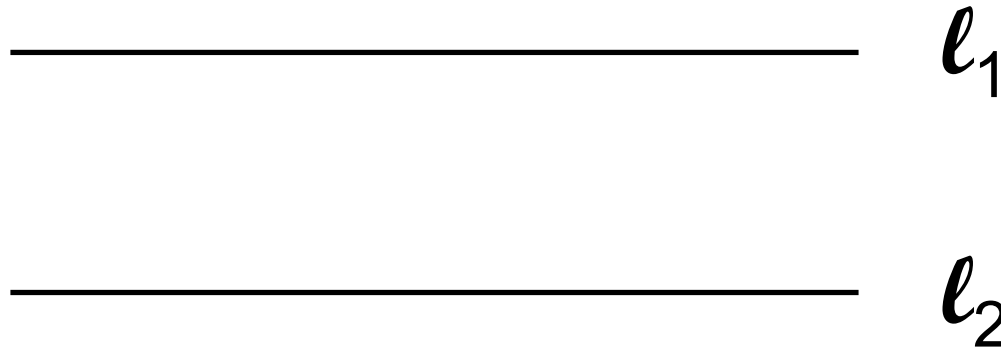
These regions are referred to as:

Interior Region – Region bounded by both lines.

Exterior Region – The remaining outside regions.



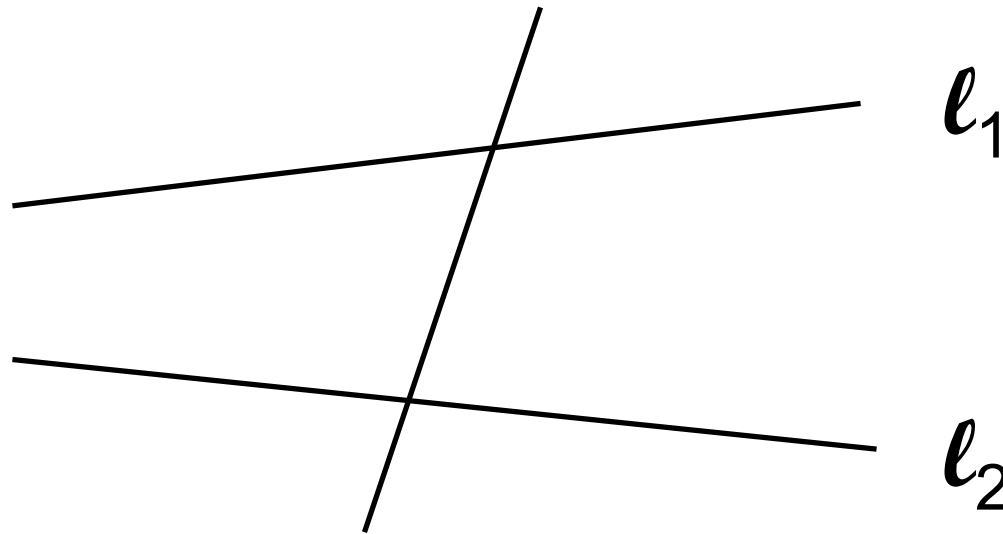
Parallel Lines – Lines that never intersect.



Notation

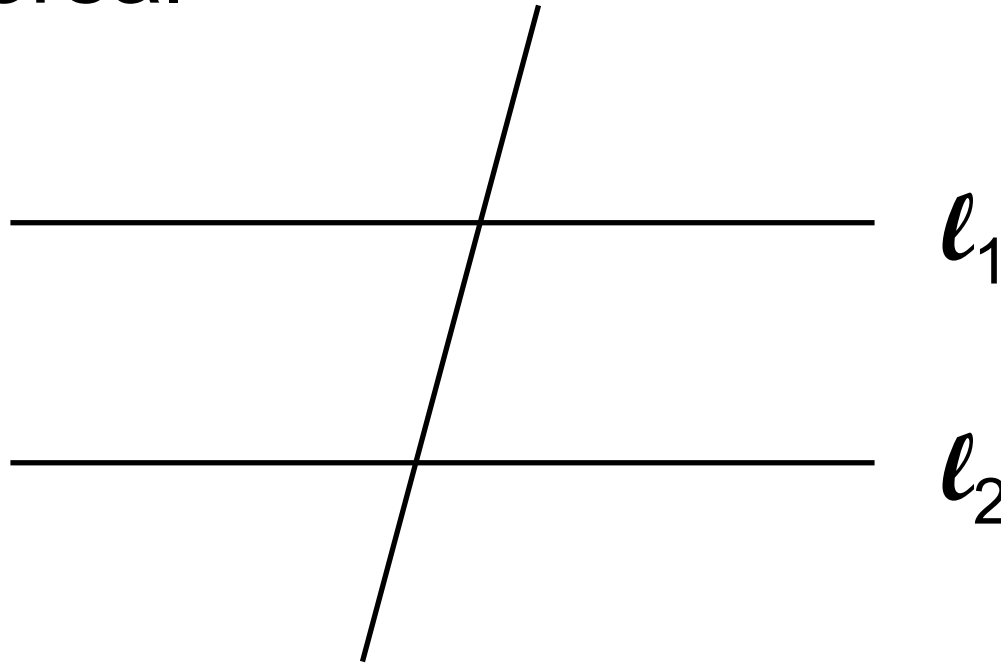
$$l_1 \parallel l_2$$

Transversal – A line that intersects two or more lines in different points.



Note: l_1 is not parallel to l_2
($l_1 \nparallel l_2$)

Transversal



Note: l_1 is parallel to l_2
($l_1 \parallel l_2$)

Angles

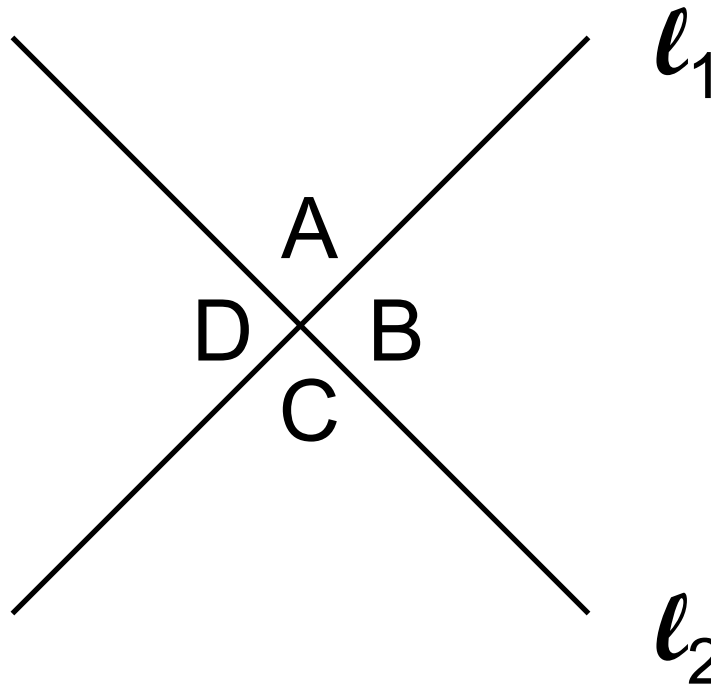
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Angles are formed when lines intersect.



Note: ($l_1 \nparallel l_2$)

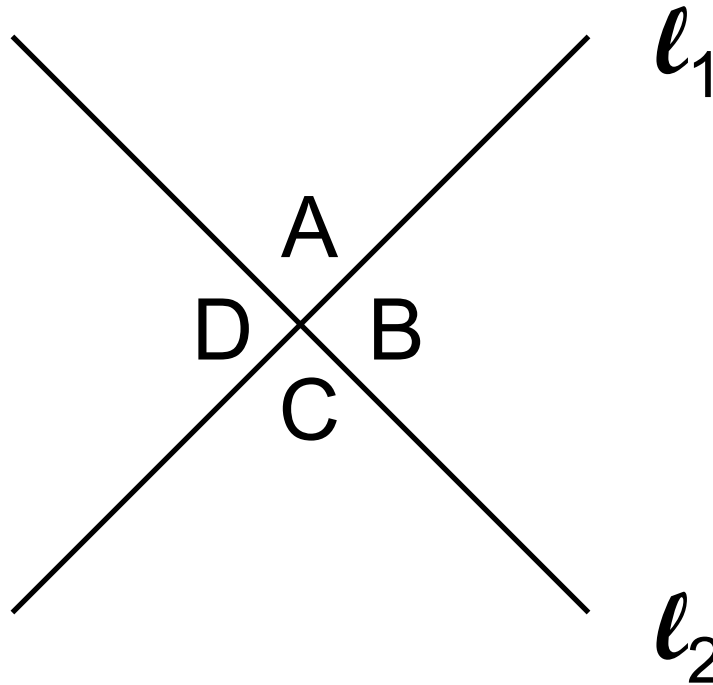
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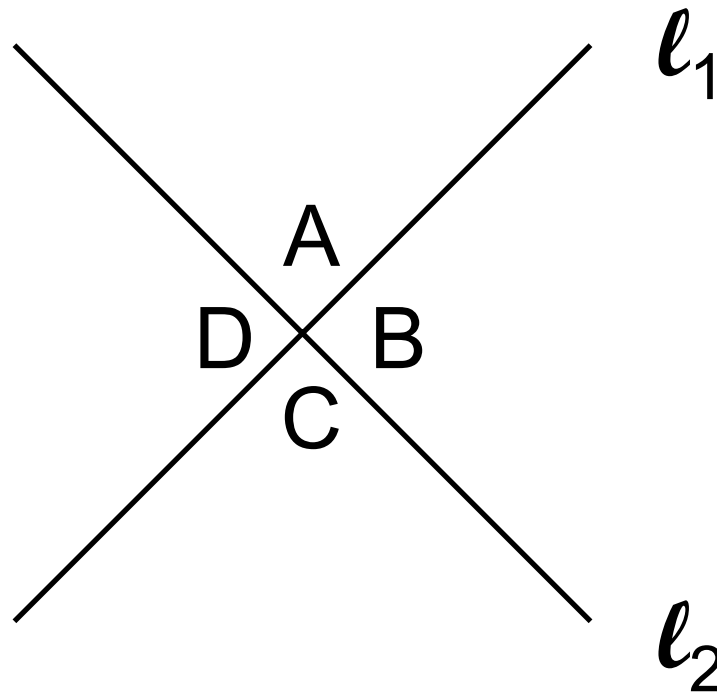
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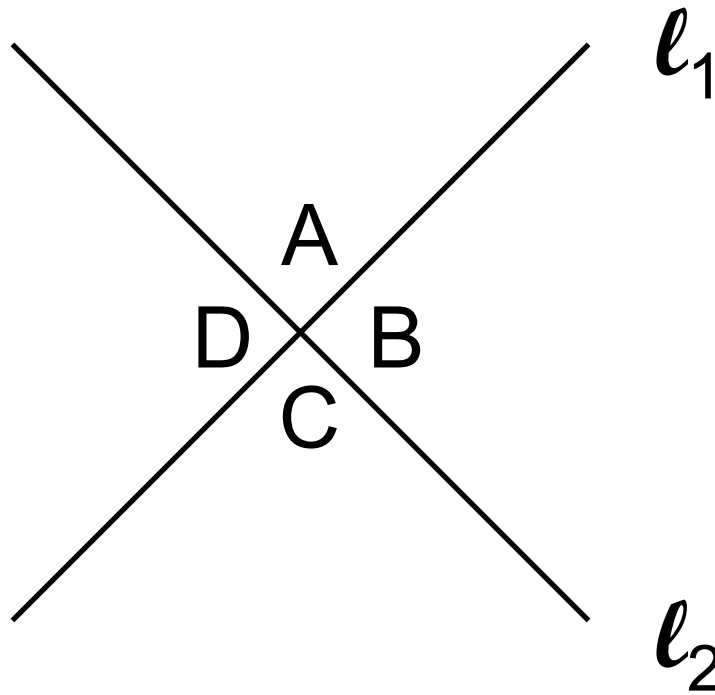
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$\angle A$ and $\angle B$ are said to be adjacent.
(neighbors)



Adjacent Angles – Angles that share a common vertex and a common side between them.





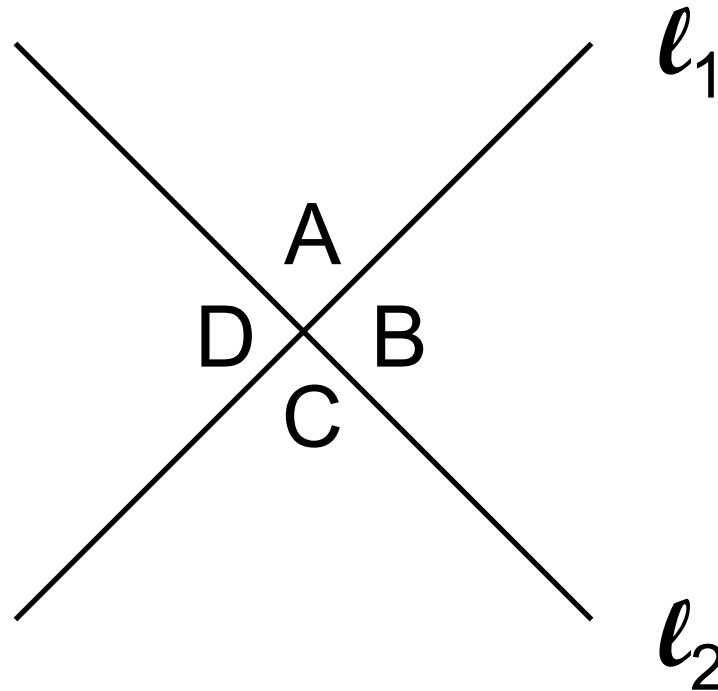
Note:

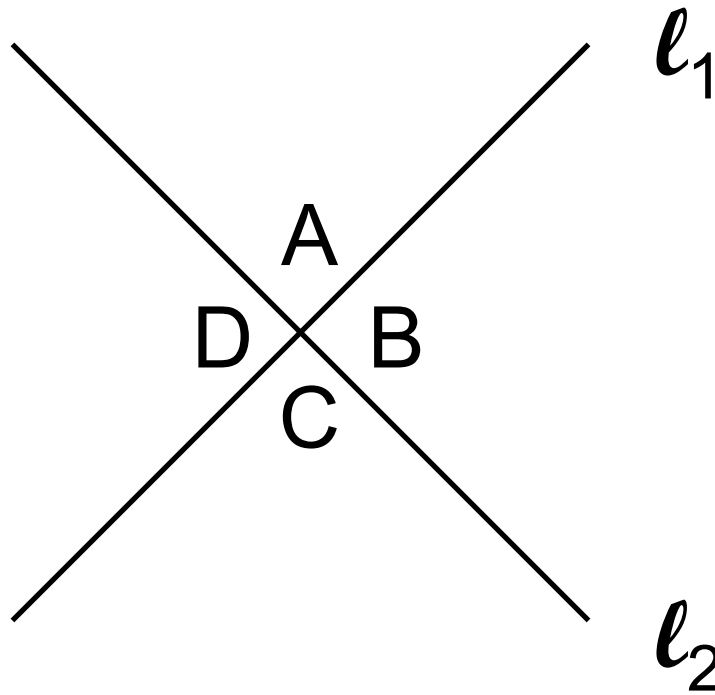
$\angle B$ and $\angle C$ are adjacent (neighbors)

$\angle C$ and $\angle D$ are adjacent (neighbors)

$\angle D$ and $\angle A$ are adjacent (neighbors)

Vertical Angles – The pairs of non-adjacent angles formed by the intersection of two lines.





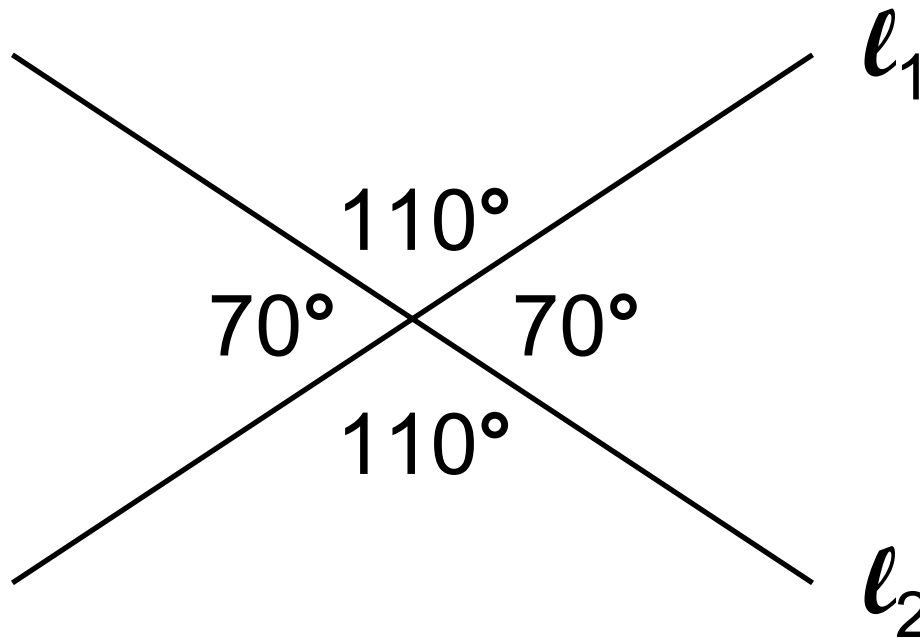
Note:

$\angle A$ and $\angle C$ are vertical angles

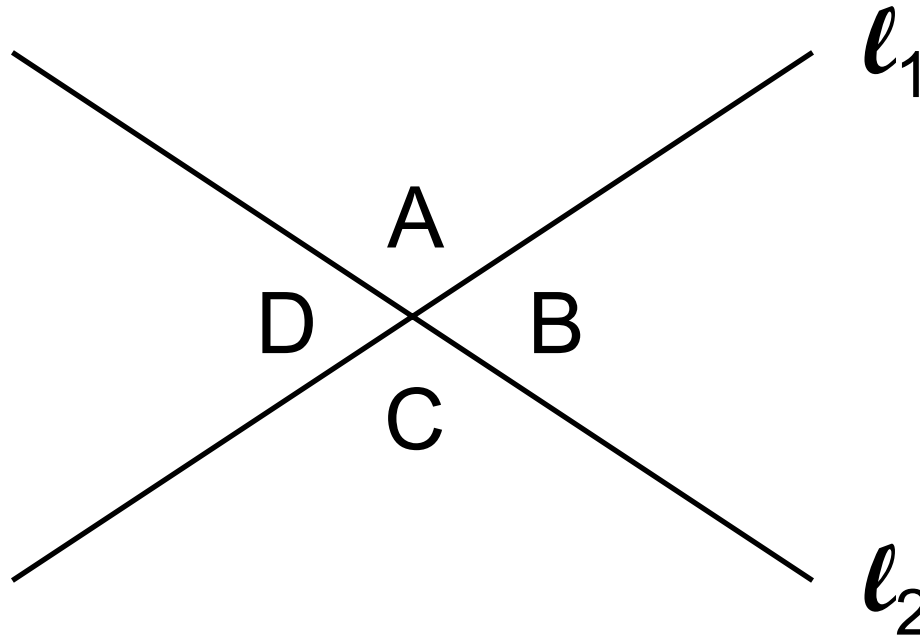
$\angle B$ and $\angle D$ are vertical angles

Q: What's special about vertical angles?

Answer – They have the same measure.
(they are congruent)



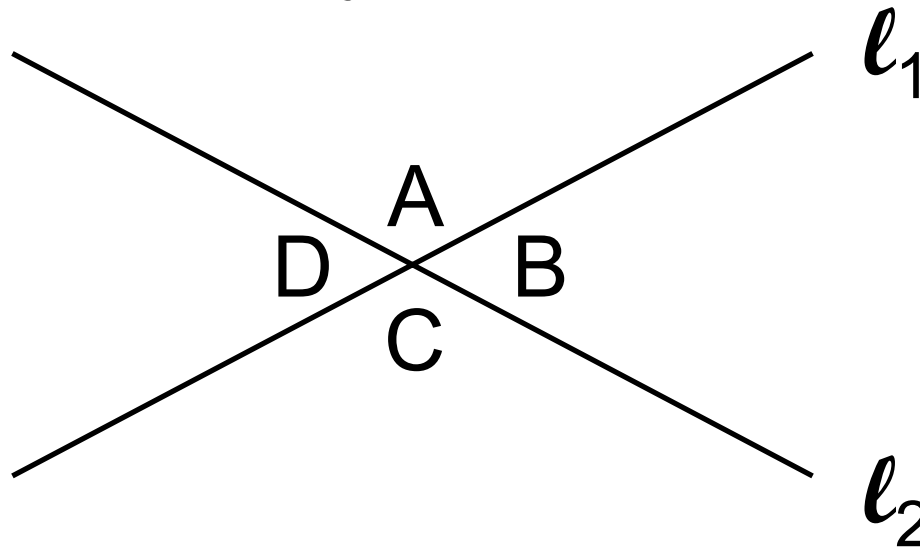
Fact – When you intersect two lines at a point



$$\angle A \cong \angle C \text{ (congruent)}$$

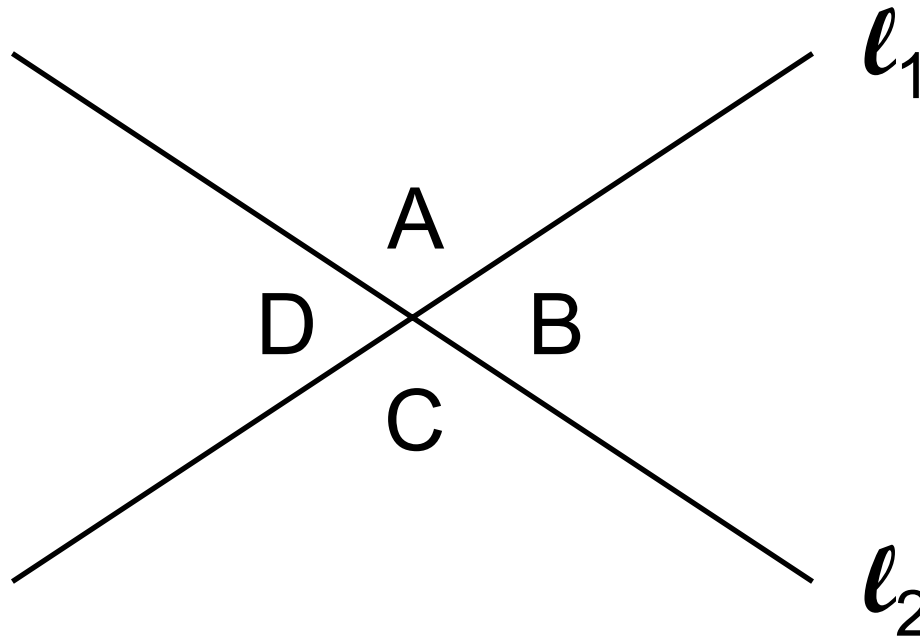
$$\angle B \cong \angle D \text{ (congruent)}$$

Two angles are said to be supplementary if their sum measures 180° . Adjacent angles formed by two intersecting lines are supplementary.



$\angle A$ and $\angle B$ are supplementary angles.

Can you find any other supplementary angles in the figure below?



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Note: Angles whose sum measures 90° are said to be complementary.

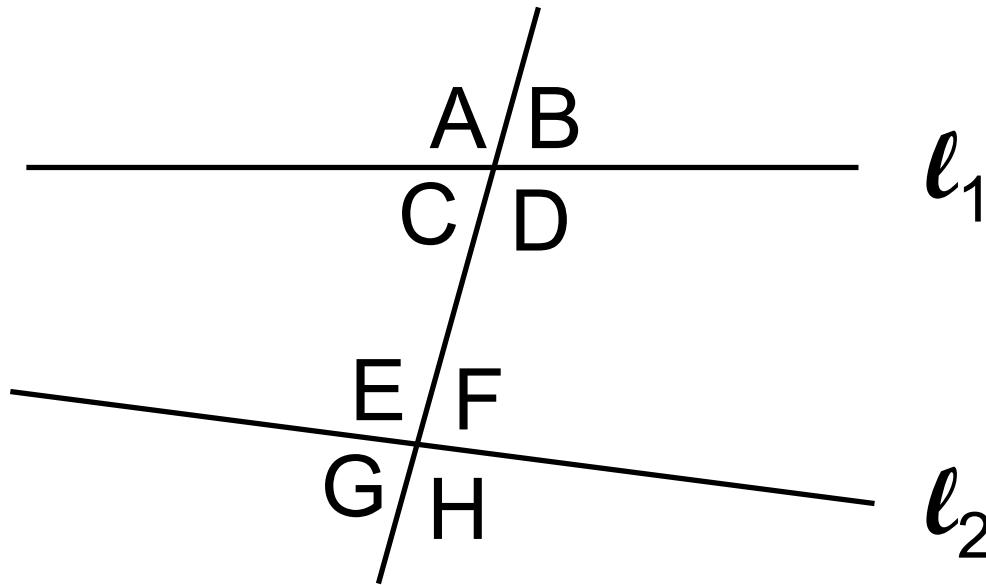
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Revisiting the transversal, copy this picture in your notebook.



Note: ($l_1 \nparallel l_2$)

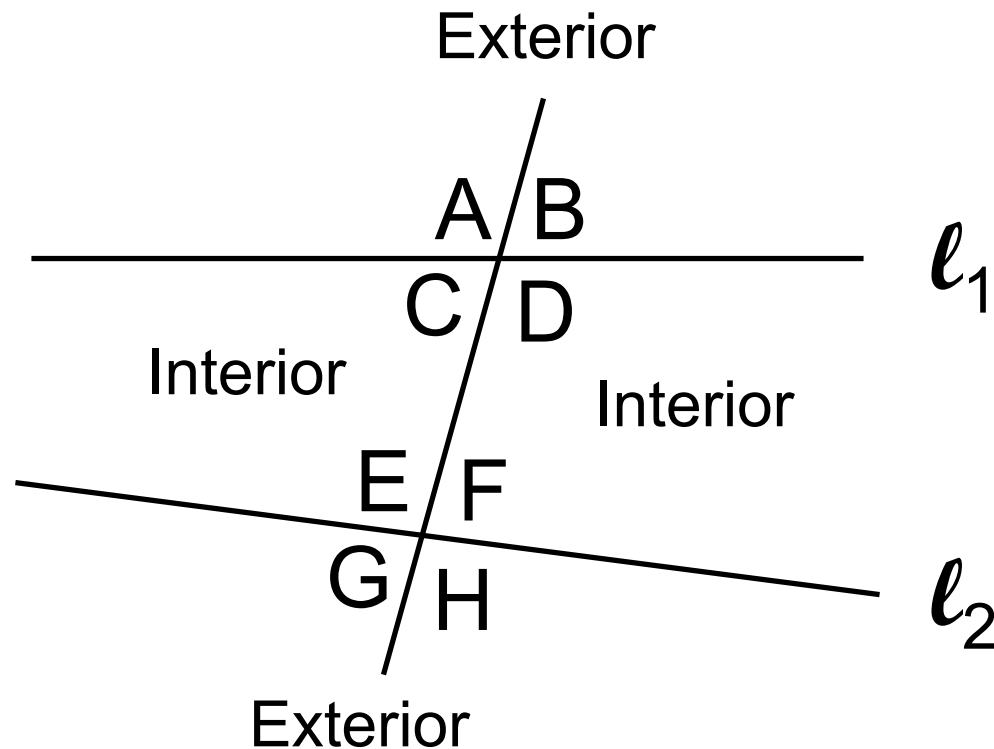
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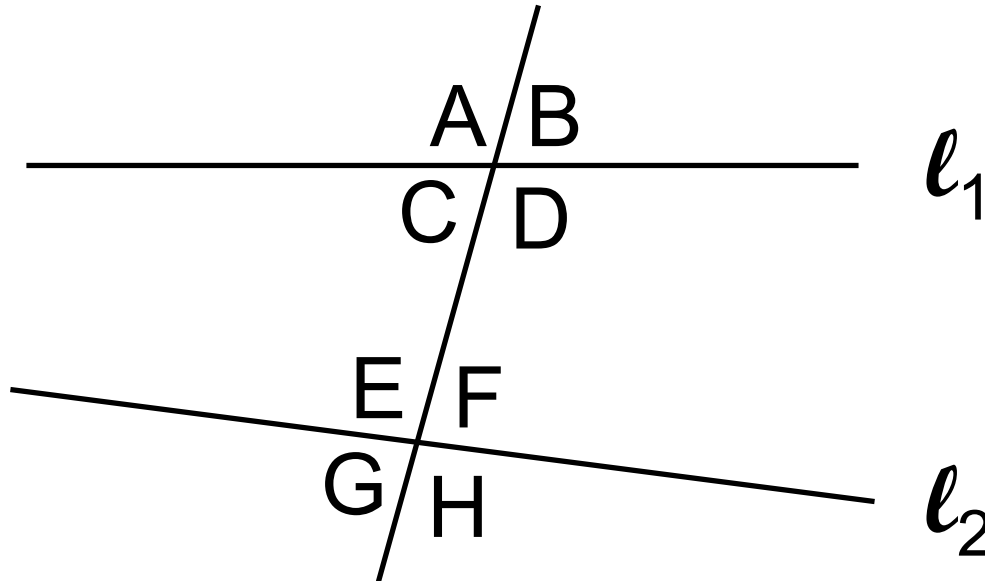
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Angles in the interior region between the two lines are called interior angles. Angles in the exterior region are called exterior angles.



Q: Which are the interior angles and exterior angles?

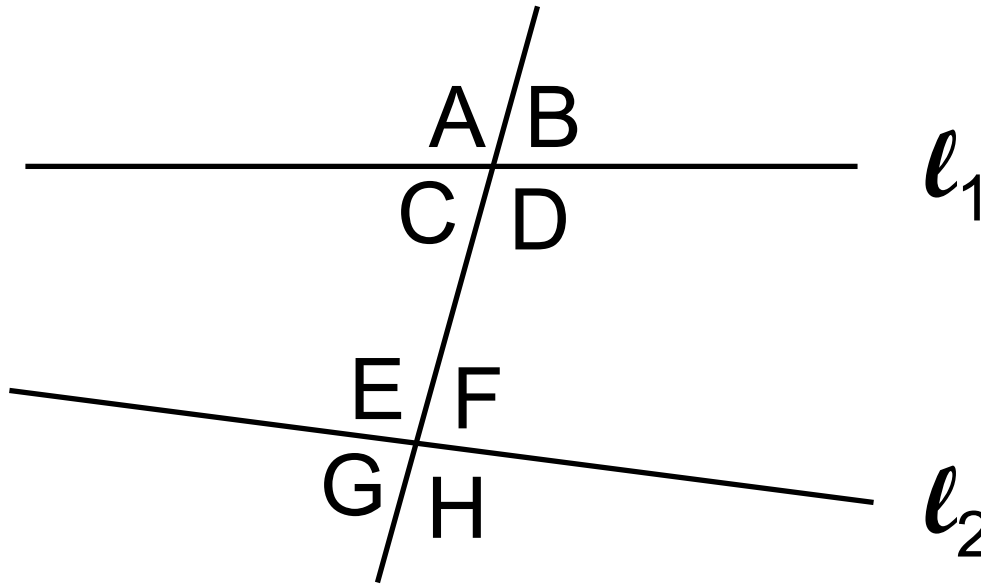


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Answer—

Interior

$\angle C$

$\angle D$

$\angle E$

$\angle F$

Exterior

$\angle A$

$\angle B$

$\angle G$

$\angle H$

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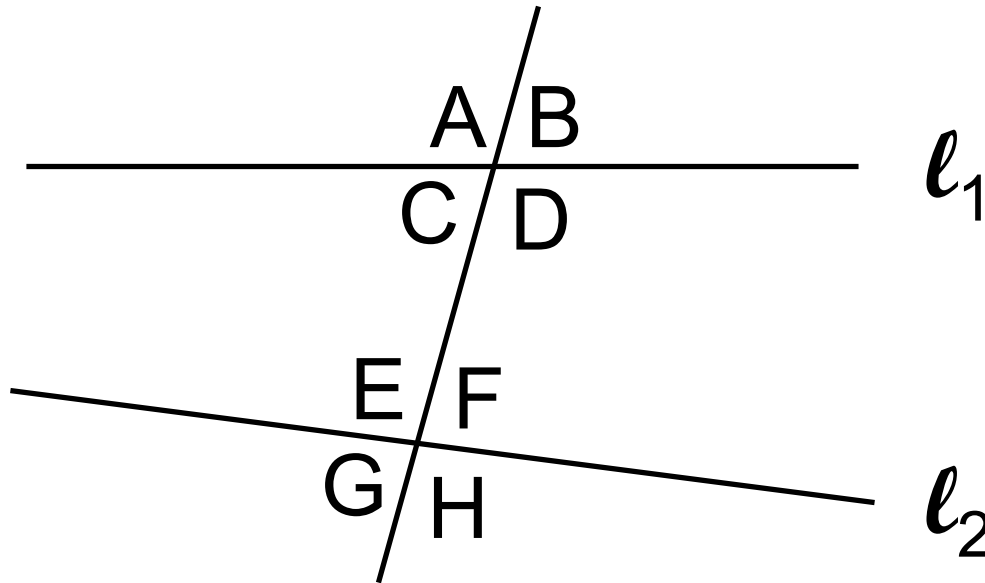
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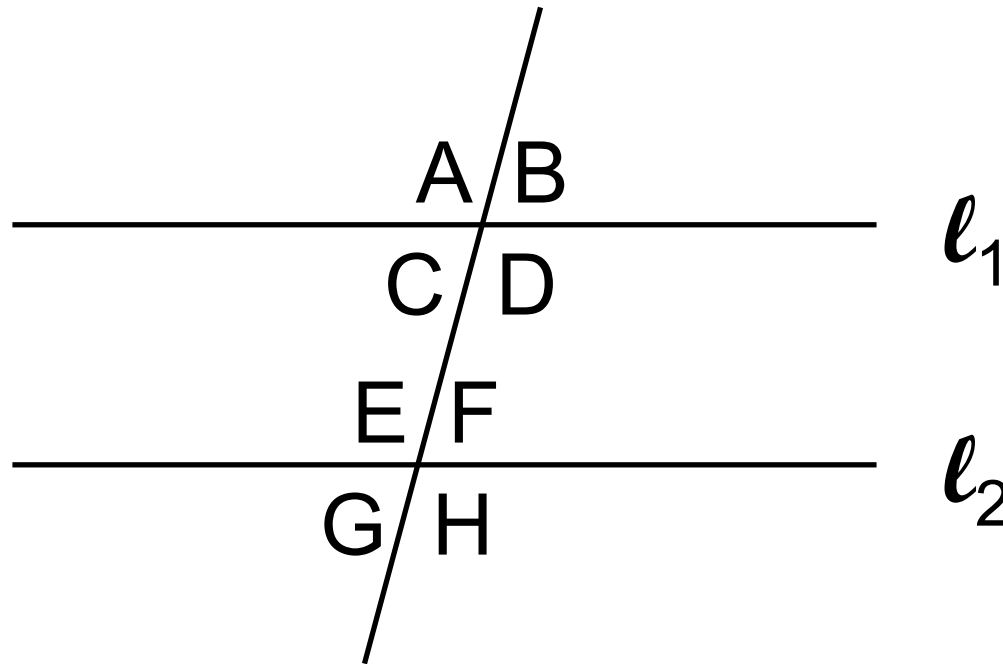
Q: Which angles are adjacent?

Q: Which angles are vertical?

Q: Which angles are supplementary?



Consider a transversal consisting of the two parallel lines.

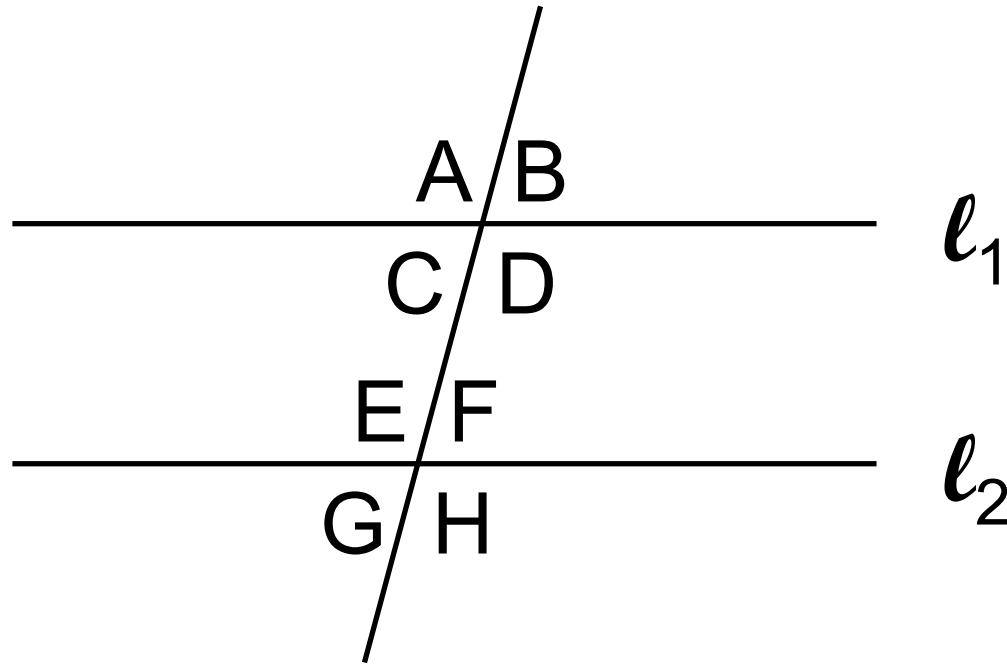


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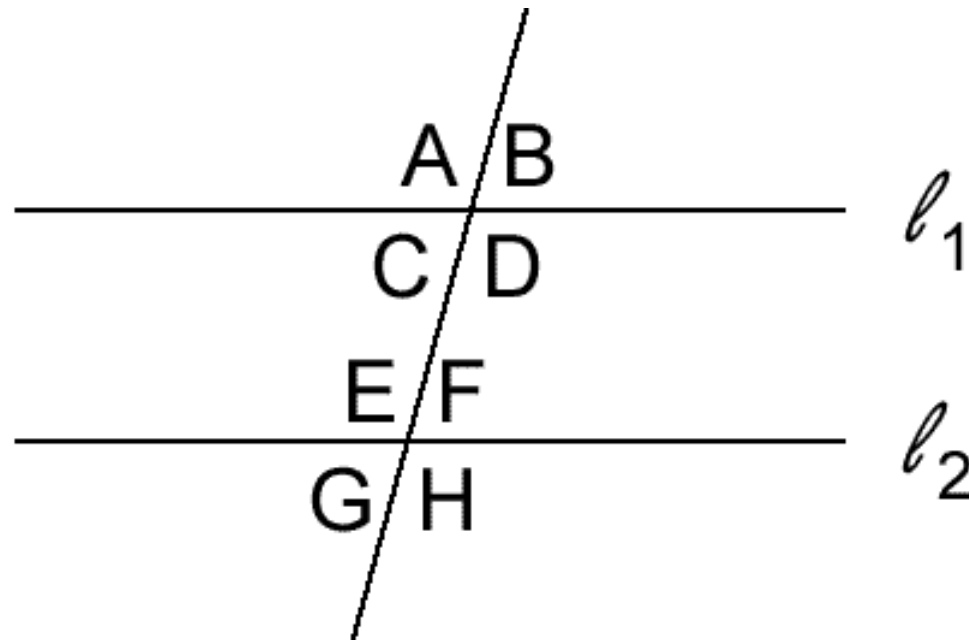
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We know, $\angle A \cong \angle D$
 $\angle B \cong \angle C$
 $\angle E \cong \angle H$
 $\angle G \cong \angle F$

since they are all vertical angles.

Q: Are any other angles congruent?



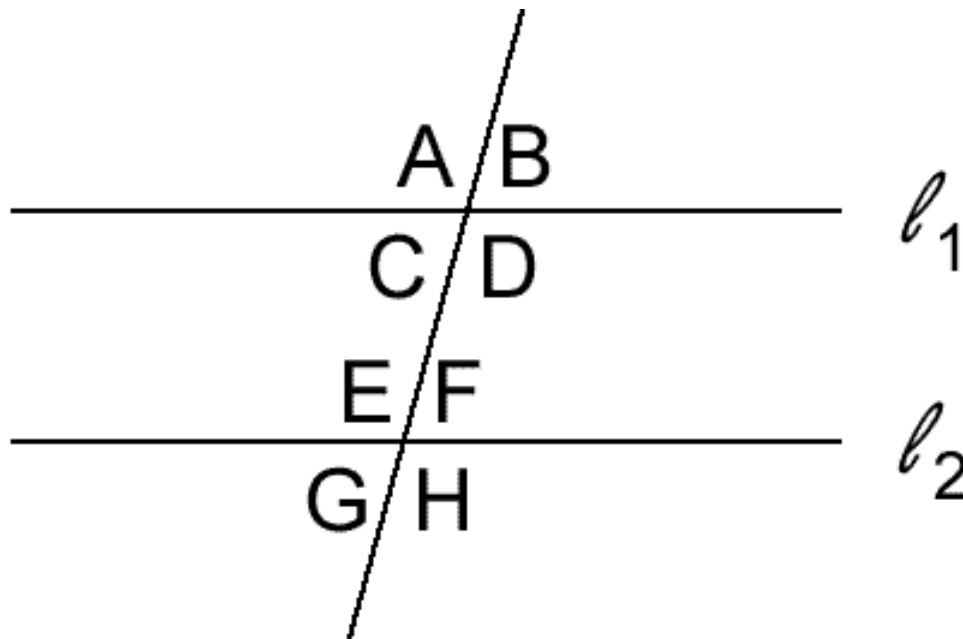
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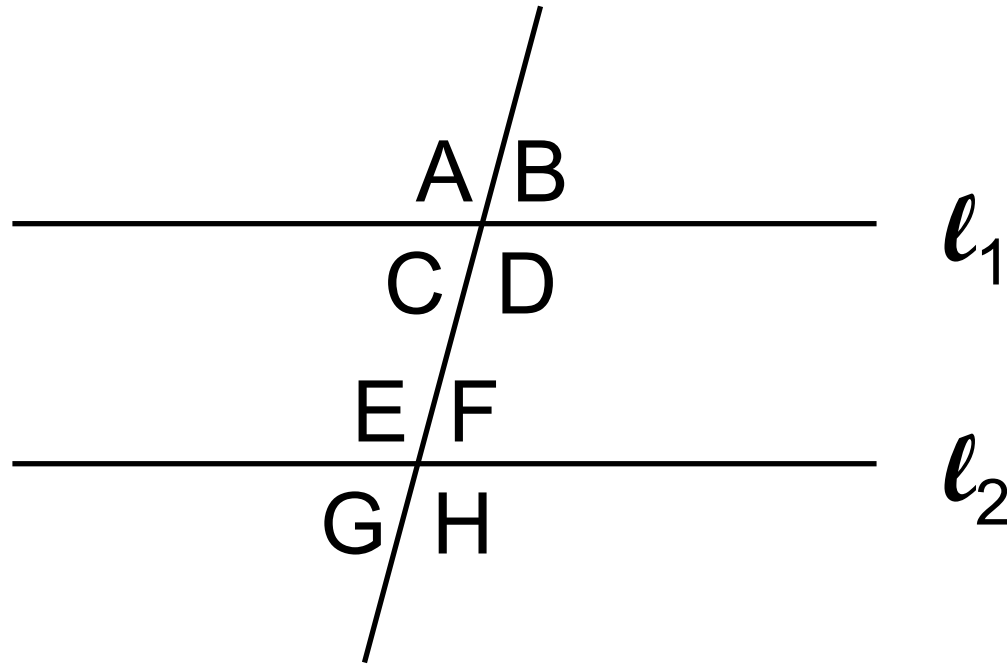
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Yes! If we could slide l_2 up to l_1 , we would be looking at the following picture.

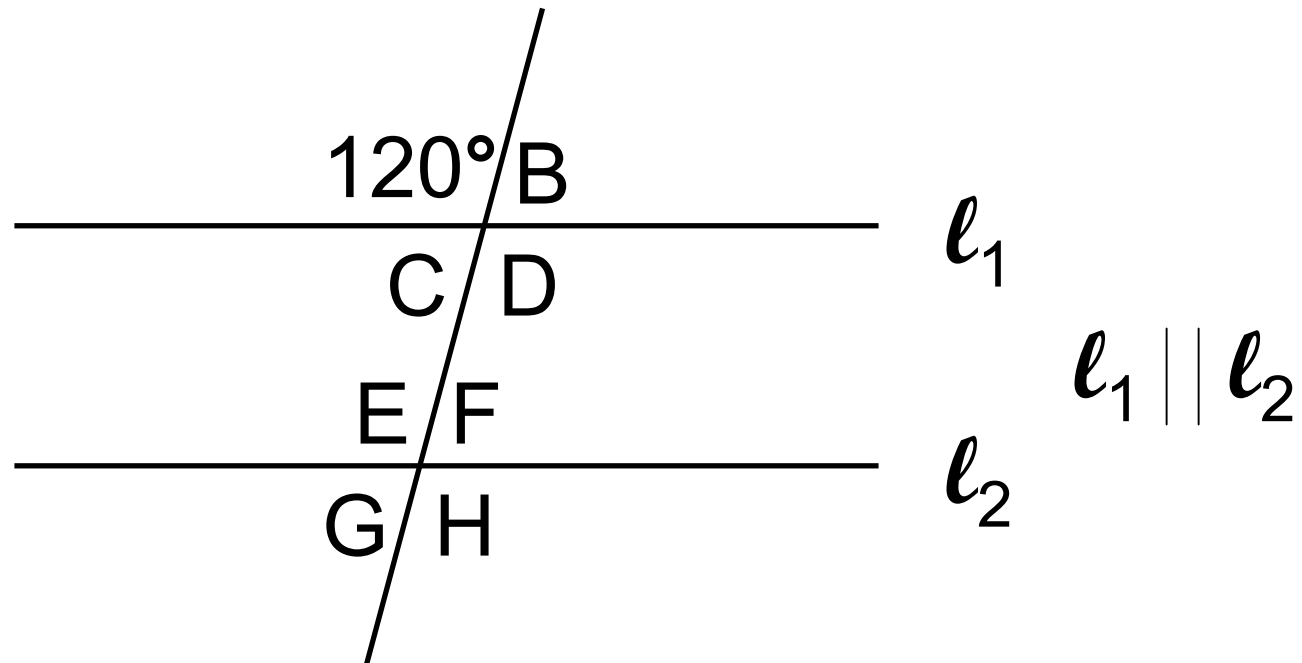




This means the following is true:

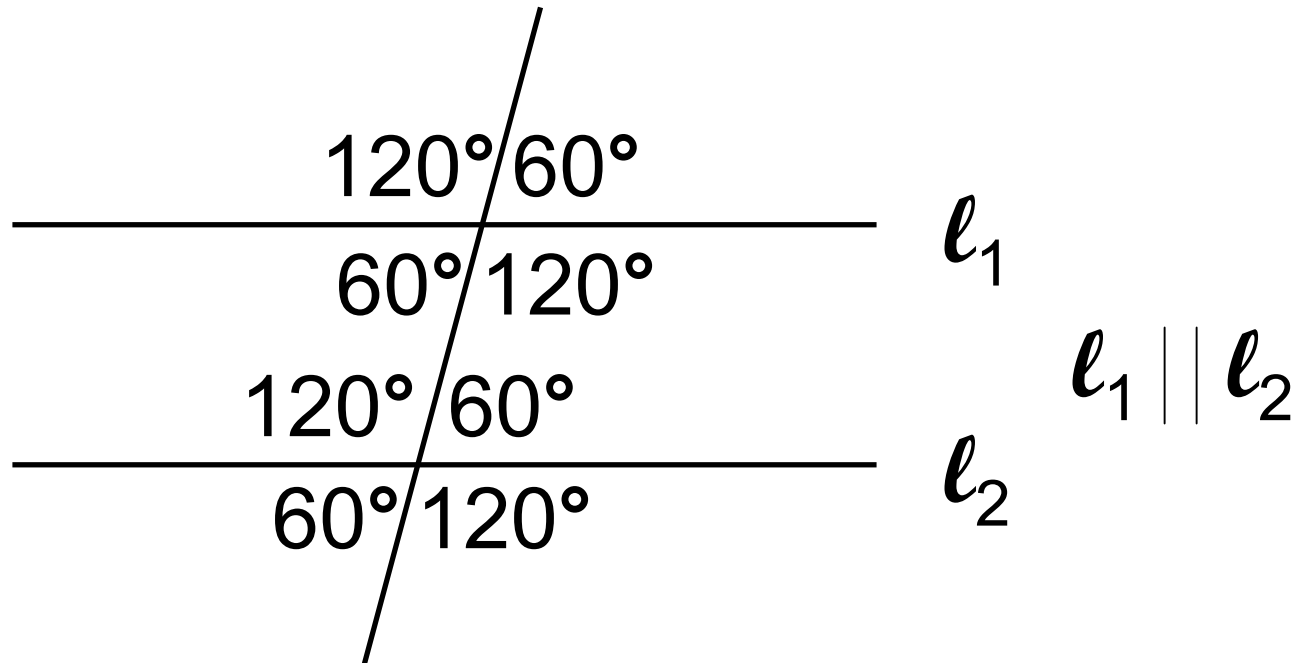
- $\angle A$ and $\angle E$ have the same measure (congruent)
- $\angle B$ and $\angle F$ have the same measure (congruent)
- $\angle C$ and $\angle G$ have the same measure (congruent)
- $\angle D$ and $\angle H$ have the same measure (congruent)

Having knowledge of one angle in the special transversal below, allows us to deduce the rest of the angles.



What are the measures of the other angles?

Answer:



Why?

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Triangles

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One of the most familiar geometric objects is the triangle. In fact, trigonometry is the study of triangles

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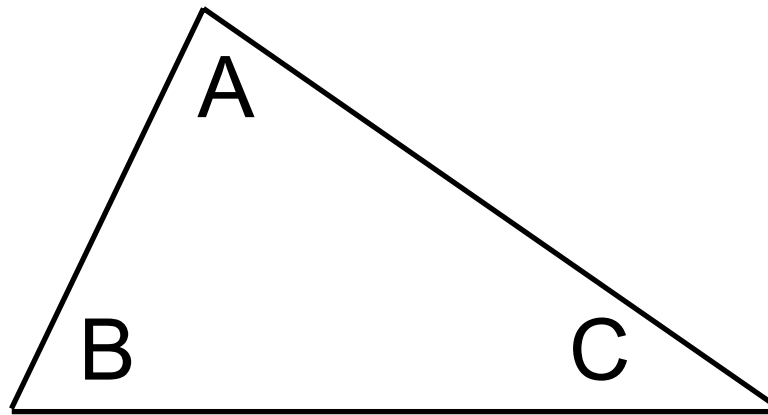
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Triangles have two important properties

1. 3 sides
2. 3 interior angles



We also have some special triangles.

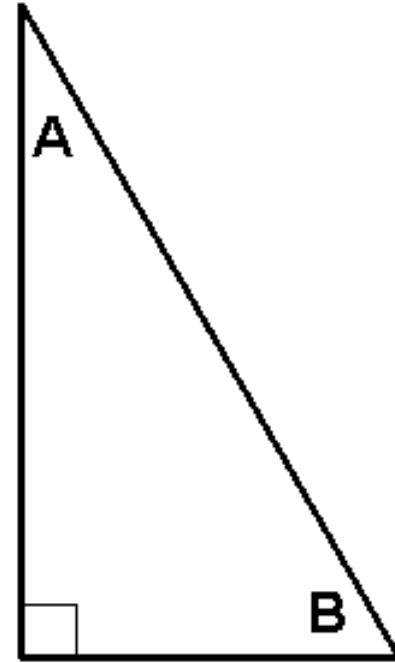
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Right Triangle —
One interior angle of
the triangle measures
 90° (has a right angle)



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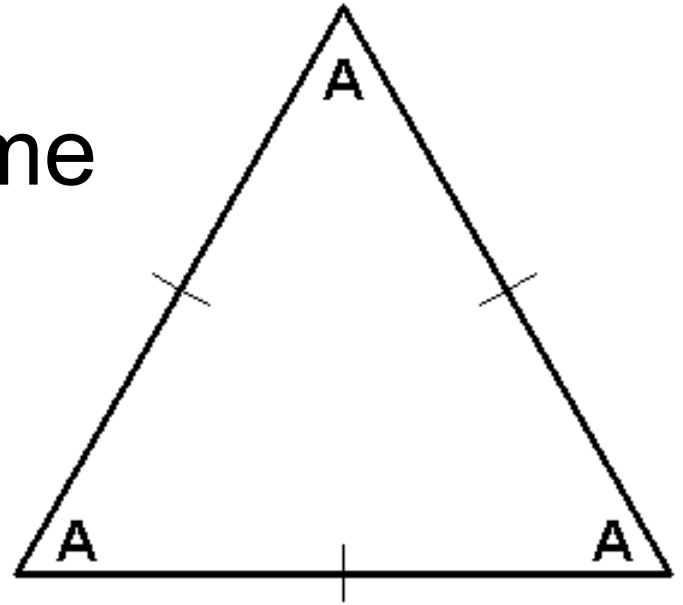
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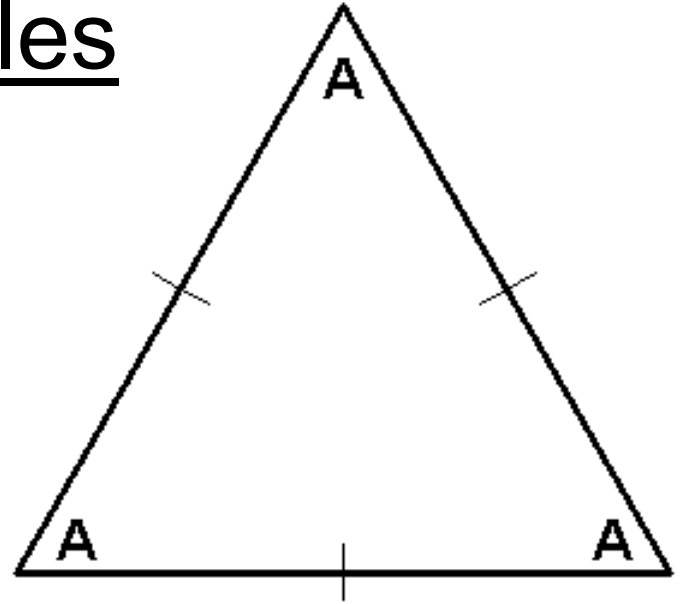
Equilateral Triangle —

1. All of the sides are congruent (have the same measure).

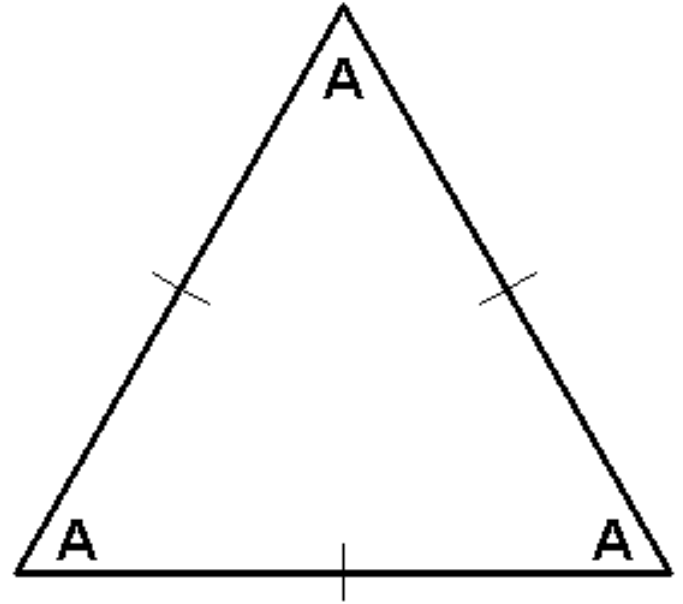


Equiangular Triangle —

1. All of the interior angles are congruent (have the same measure).



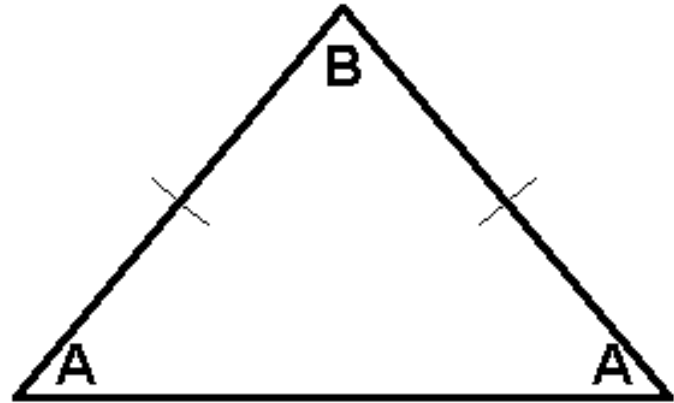
Note – Equiangular triangles are also equilateral triangles. Equilateral triangles are also equiangular triangles.



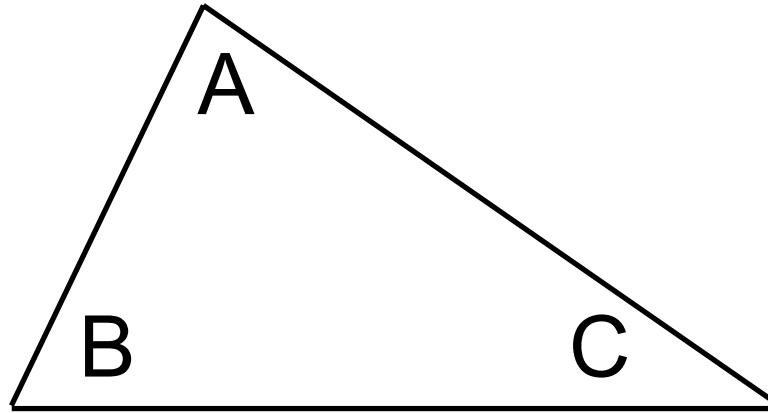
Isosceles Triangle —

1. Two of the interior angles of the triangle are congruent (have the same measure).

2. Two of the sides are congruent.



The sum of the interior angles of any triangle measures 180°



That is, $\angle A + \angle B + \angle C = 180^\circ$

Why?

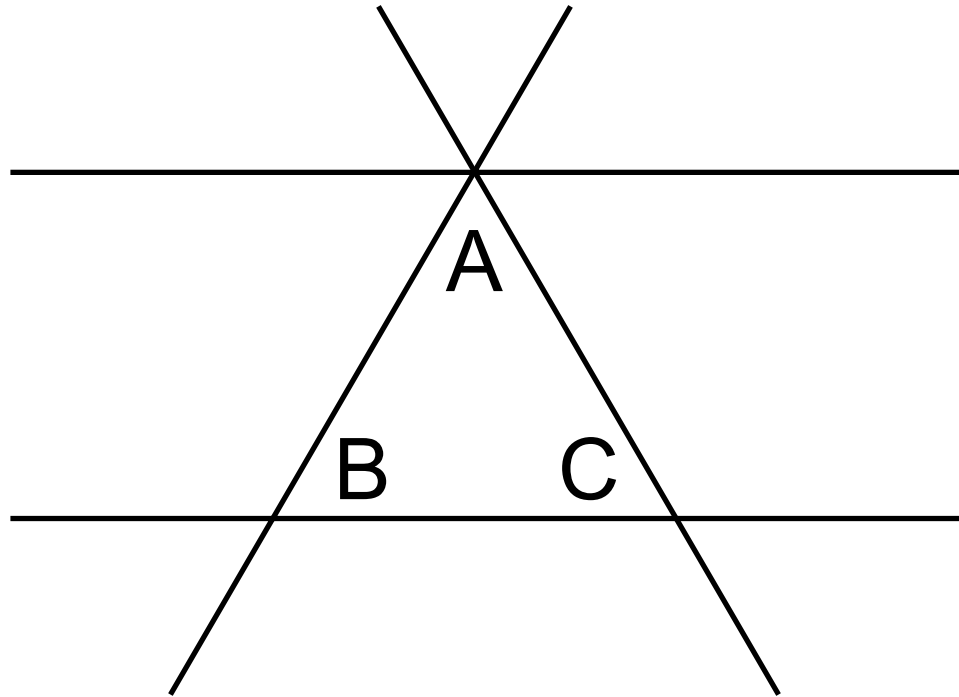
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Form a transversal with two parallel lines.



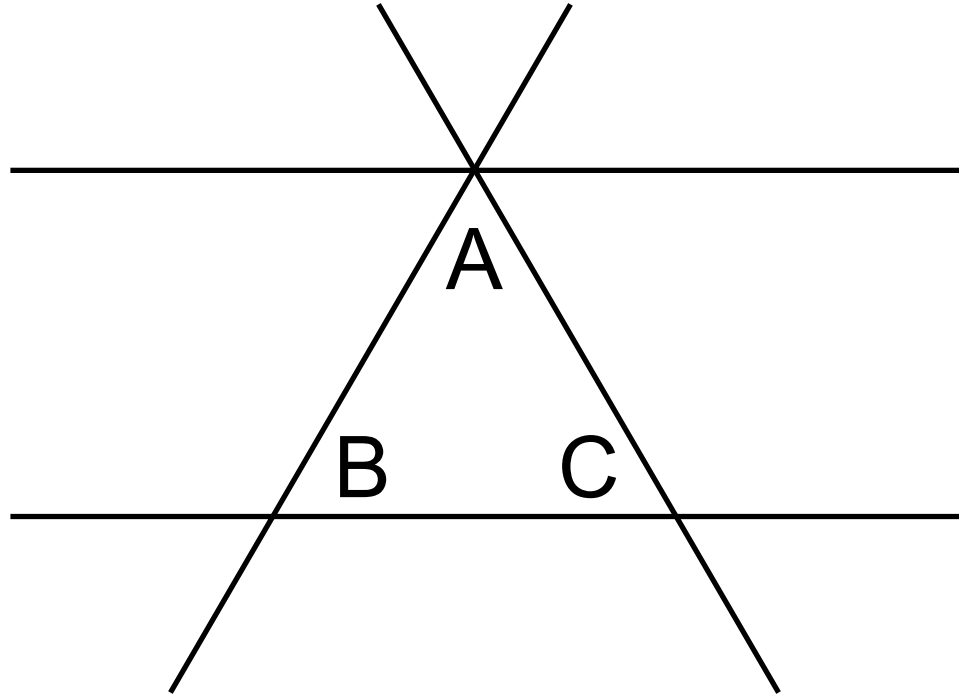
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Fill in the missing vertical angles.



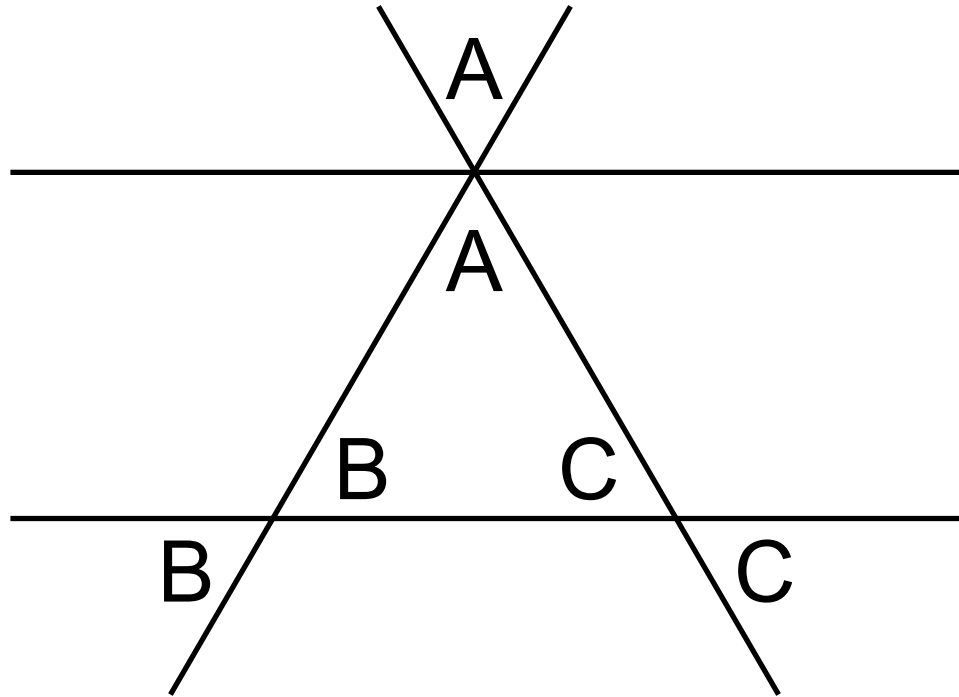
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Solution--



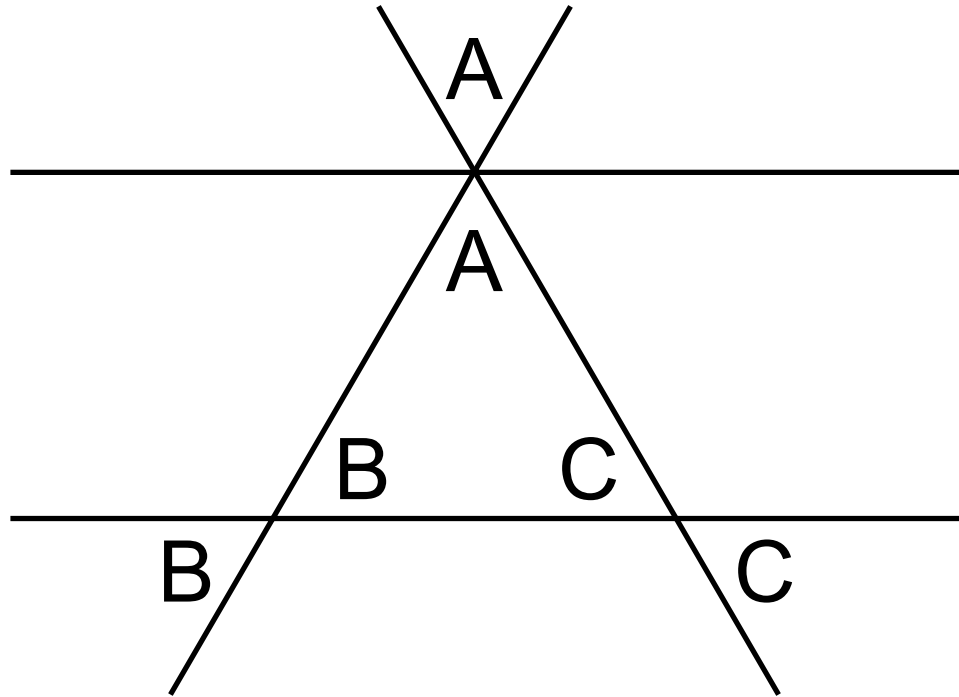
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Fill in the remaining angles.



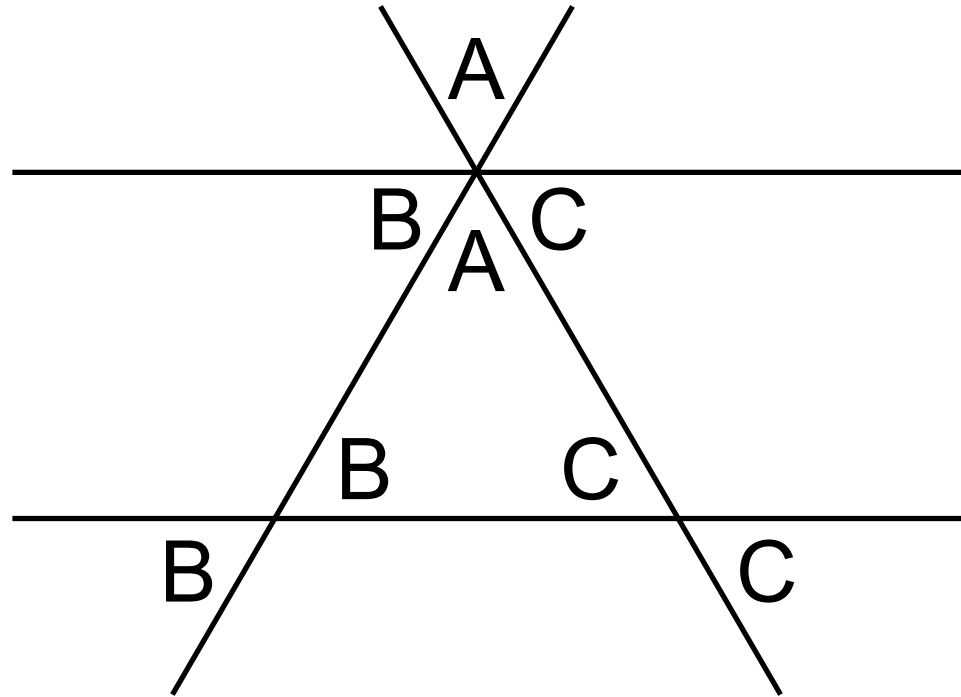
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Solution--



Do you notice anything?

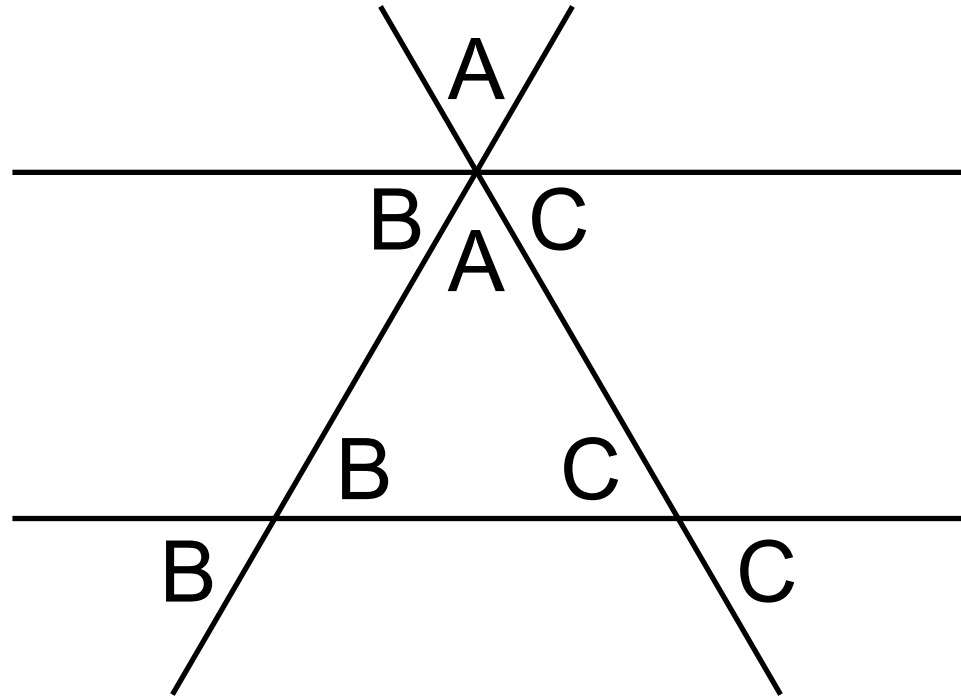
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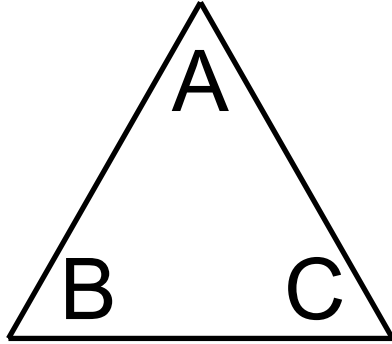
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That is, $\angle B + \angle A + \angle C = 180^\circ$



Note – The order in which we add doesn't matter.



$\angle A + \angle B + \angle C = 180^\circ$
(This is true for any triangle)

End of Review of Geometry

Title V

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