



**Geometry Journey Video Series**

**Program #5**

**Triangles**

**Satellite Broadcasting  
VHS  
and Internet/Intranet Streaming**



Topic

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## **Program Description**

This video covers the properties of the simplest polygon, triangle, in detail. All aspects are introduced, including the sum of three interior angles, how to construct a triangle, how to classify triangles by sides and angles, congruent, similarity and similar triangles. This video not only provides students with an opportunity to view triangles from a new angle, but also helps them understand the unique properties such as the great stability provided by triangles.

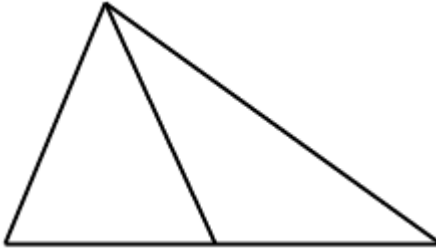
This program is the #5 episode in the fifteen 15-minute Geometry Journey Series.

## **Synopsis**

This program will cover the following topics:

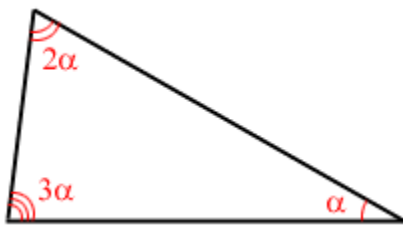
1. Introduction to Triangles
2. Construction of a Triangle
3. Types by Sides
  - a) Equilateral Triangles
  - b) Isosceles Triangles
  - c) Scalene Triangles
4. Types by Angles
  - a) Right Triangles
  - b) Obtuse Triangles
  - c) Acute Triangles
  - d) Equiangular Triangles
5. Congruence
6. Similarity
7. Similar Triangles
8. Pythagorean Theorem

1) How many triangles can you find in this figure?



2) Is every non-scalene triangle isosceles? Yes \_\_\_ No \_\_\_ Depends \_\_\_  
Is every non-scalene triangle equilateral? Yes \_\_\_ No \_\_\_ Depends \_\_\_

3) If the ratio of the measures of the three angles of a triangle is  $1 : 2 : 3$ , what triangle is it?



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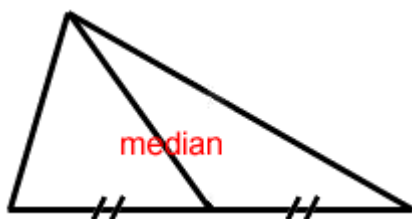
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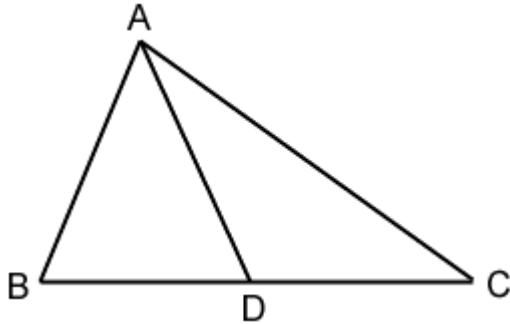
## Discussion Questions

**Question:** Given a triangle, a straightedge and a pair of compass, how do we construct the median of the given triangle? The median of a given triangle is the line segment joining one vertex and the midpoint of the opposite side.



1) How many triangles can you find in this figure?

**Answer:** Three triangles. They are ABC, ABD and ADC.

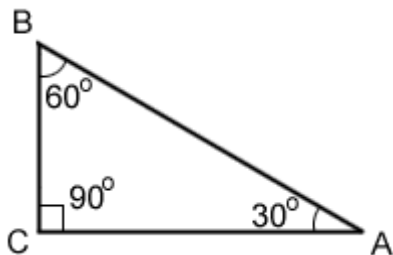


2) Is every non-scalene triangle isosceles?      Yes X      No \_\_\_      Depends \_\_\_  
Is every non-scalene triangle equilateral?      Yes \_\_\_      No \_\_\_      Depends X

By definition, a scalene triangle has no sides congruent. Therefore, a non-scalene triangle has either two or possibly three sides congruent.

Since a non-scalene triangle has at least two sides congruent, it is definitely isosceles. A non-scalene triangle is equilateral only when it happens to have three sides congruent.

3) If the ratio of the measures of the three angles of a triangle is 1 : 2 : 3, what triangle is it?



**Answer:** Since  $m\angle A : m\angle B = 1 : 2$  and  $m\angle A : m\angle C = 1 : 3$ , we have  
 $m\angle B = 2m\angle A$   
 $m\angle C = 3m\angle A$

Because  $m\angle A + m\angle B + m\angle C = 180^\circ$ , we have

$$m\angle A + 2m\angle A + 3m\angle A = 180^\circ$$

$$6m\angle A = 180^\circ$$

$$m\angle A = 30^\circ$$

$$m\angle C = 3m\angle A = 90^\circ$$

It is a right triangle.

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## Hints to Discussion Questions

**Question:** Given a triangle, a straightedge and a pair of compass, how do we construct the median of the given triangle? The median of a given triangle is the line segment joining one vertex and the midpoint of the opposite side.

**Hints:** Since the knowledge of the two points is required to construct the median and one of them (the vertex) is given, the problem becomes finding the midpoint of the side opposite the vertex.

Please check the section Midpoint of a Segment and Bisector (Program #2 in Geometry Journey Series) for details on how to bisect a line segment.

Assume we have found the midpoint of the side. Use a straightedge to connect the vertex and the midpoint. The resulting line segment is the median we need to construct.

- End -