

Home

Arithmetic

Algebra

Geometry

Statistics

Probability

Set Theory

Trigonometry

Matrices

SAT Preparation

ACT Preparation

GMAT Preparation

Math Worksheets

Math Games

Math Trivia

How Things Work

Related Links

Google

Web onlinemathlearning.com

Search

## Geometry: Types Of Triangles

This lesson reviews the common types of triangles in geometry.

Triangles are three-sided shapes that lie in one [plane](#). Triangles are a type of [polygons](#). The sum of all the [angles](#) in any triangle is  $180^\circ$ .

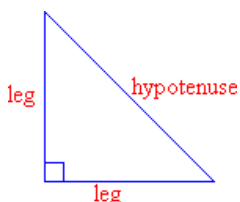
Triangles can be classified according to the size of its angles. Some examples are [right triangles](#), [acute triangles](#) and [obtuse triangles](#).

The lengths of the sides of triangles is another common classification for types of triangles. Some examples are [equilateral triangles](#), [isosceles triangles](#) and [scalene triangles](#).

### Right Triangles

A right triangle is a triangle with a [right angle](#) (i.e.  $90^\circ$ ).

You may have noticed that the side opposite the right angle is always the triangle's longest side. It is called the [hypotenuse](#) of the triangle. The other two sides are called the [legs](#). The lengths of the sides of a right triangle are related by the [Pythagorean Theorem](#). There are also [special right triangles](#).



**Example 1:** A right triangle has one other angle that is  $35^\circ$ . What is the size of the third angle?

**Solution:**

**Step 1:** A right triangle has one angle =  $90^\circ$ . Sum of known angles is  $90^\circ + 35^\circ = 125^\circ$ .

**Step 2:** The sum of all the angles in any triangle is  $180^\circ$ . Subtract sum of known angles from  $180^\circ$ .  $180^\circ - 125^\circ = 55^\circ$

**Answer:** The size of the third angle is  $55^\circ$

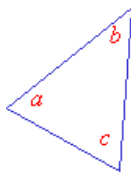
### Acute Triangles

An acute triangle is a triangle whose angles are all [acute](#) (i.e. less than  $90^\circ$ ). In the acute triangle shown below, *a*, *b* and *c* are all acute angles.

**Example 1:** A triangle has angles  $46^\circ$ ,  $63^\circ$  and  $71^\circ$ . What type of triangle is this?

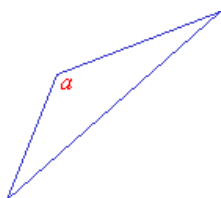
**Answer:** Since all its angles are less than  $90^\circ$ , it is an acute triangle.

IndiaGoldenTriangle.MakemyTrip.com  
Arts by Google



### Obtuse Triangles

An obtuse triangle has one [obtuse angle](#) (i.e. greater than  $90^\circ$ ). The longest side called the hypotenuse is always opposite the obtuse angle. In the obtuse triangle shown below,  $a$  is the obtuse angle.



**Example 1:** Is it possible for a triangle to have more than one obtuse angle?

**Solution:**

**Step 1:** Let the angles of the triangle be  $a$ ,  $b$  and  $c$ . Let  $a$  be the obtuse angle.

**Step 2:** The sum of all the angles in any triangle is  $180^\circ$ .  $a + b + c = 180^\circ$ .

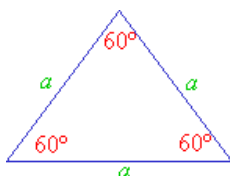
If  $a > 90^\circ$  then  $b + c$  must be less than  $90^\circ$ . Therefore,  $b$  and  $c$  must be acute angles.

**Answer:** No, a triangle can only have one obtuse angle.

Besides classifying types of triangles according to the size of its angles as above: [right triangles](#), [acute triangles](#) and [obtuse triangles](#); types of triangles can also be classified according to the length of its sides. Some examples are [equilateral triangles](#), [isosceles triangles](#) and [scalene triangles](#).

### Equilateral Triangles

An equilateral triangle has all three sides equal in length. Its three angles are also equal and they are each  $60^\circ$ .



**Example 1:** An equilateral triangle has one side that measures 5 in. What is the size of the angle opposite that side?

**Solution:**

**Step 1:** Since it is an equilateral triangle all its angles would be  $60^\circ$ . The size of the angle does not depend on the length of the side.

**Answer:** The size of the angle is  $60^\circ$ .

### Isosceles Triangles

An isosceles triangle has two sides of equal length. The angles opposite the equal sides are also equal.

WONDER OF WONDERS!

Golden Triangle Tour  
US\$ 1970

More exciting packages available

Book now

make my trip .com  
Your India Travel Specialist

IndiaGoldenTriangle.MakeMyTrip.com  
Ads by Google

#### What Is Glaucoma?

Learn About the Signs, Symptoms & Causes Of Glaucoma.

[RevolutionHealth.com](#)

#### Triangle

Great deals on everything Triangle themed.

[Yahoo.com](#)

#### Triangle Tools

Triangle Tools, Made in Germany Free Shipping on orders over \$59

[www.CutleryAndMore.com/Triangle](#)

#### Motovario Gearbox

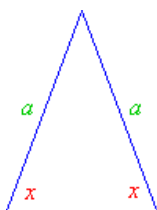
Helical Units & Geared Motors Units Available Ex-Stock

[www.Net-Eng.co.uk](#)

#### Branham Gear Boxes

Sealed Gear Case. 5 Day Delivery. Submit RFQ Today!

[wcbraham.com](#)



**Example 1:** An isosceles triangle has one angle of  $96^\circ$ . What are the sizes of the other two angles?

**Solution:**

**Step 1:** Since it is an isosceles triangle it will have two equal angles. The given  $96^\circ$  angle cannot be one of the equal pair because a triangle cannot have two obtuse angles. (Refer to [obtuse triangle](#) above).

**Step 2:** Let  $x$  be one of the two equal angles. The sum of all the angles in any triangle is  $180^\circ$ .

$$x + x + 96^\circ = 180^\circ \Rightarrow 2x = 84^\circ \Rightarrow x = 42^\circ$$

**Answer:** The sizes of the other two angles are  $42^\circ$  each.

**Example 2:** A right triangle has one other angle that is  $45^\circ$ . Besides being right triangle what type of triangle is this?

**Solution:**

**Step 1:** Since it is right triangle it will have one  $90^\circ$  angle. The other angle is given as  $45^\circ$ .

**Step 2:** Let  $x$  be third angle. The sum of all the angles in any triangle is  $180^\circ$ .

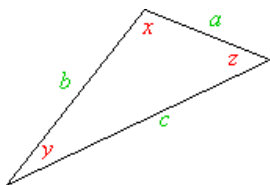
$$x + 90^\circ + 45^\circ = 180^\circ \Rightarrow x = 45^\circ$$

**Step 3:** Two of the angles are equal which means that it is an isosceles triangle.

**Answer:** It is also an isosceles triangle.

### Scalene Triangles

A scalene triangle has no sides of equal length. Its angles are also all different in size.



### Quick Recap On Types Of Triangles

We've looked at classifying types of triangles according to the size of its angles: [right triangles](#), [acute triangles](#) and [obtuse triangles](#); and also covered types of triangles according to the length of its sides: [equilateral triangles](#), [isosceles triangles](#) and [scalene triangles](#).

· Ads by Google · [Triangles](#) [Trigonometry](#) [Bolt Circle](#) [Circle Chord](#) [Example CSC](#)

Google

Web  [www.onlinemathlearning.com](http://www.onlinemathlearning.com)

#### Useful Links:

[Math.com - Types of Triangles](#)  
[MCA Online - Types of Triangles](#)

**amazon.com**

**34% Off**

Books over **\$25**  
unless marked otherwise

Shop now

Privacy Information

---

**Search Amazon.com:**

All Products

Keywords:

**Search New and Used**  
**amazon.com.**

