

TRIANGLES & THE PYTHAGOREAN THEOREM

PRAXIS FLASHCARD #30

TRIANGLE

A **triangle** is a polygon with three angles/vertices and three sides made up of line segments. A triangle can be named by its three vertices: $\triangle ABC$.

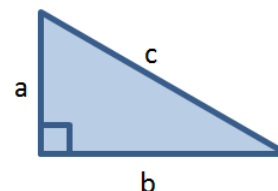
$$A = \frac{1}{2}bh \quad P = a + b + c$$



PRAXIS FLASHCARD #98

HYPOTENUSE

The **hypotenuse** is the longest side of a right triangle, often labeled "c".



PRAXIS FLASHCARD #99

LEGS OF A TRIANGLE

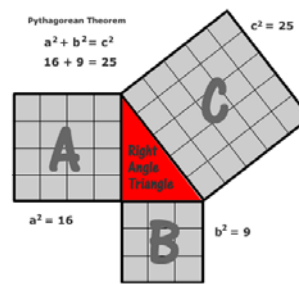
The **legs of a triangle** are the sides of the triangle. In a right triangle, the legs are usually labeled "a" and "b". The legs are the two shorter sides of a right triangle. The legs of a right triangle are perpendicular to each other.

PRAXIS FLASHCARD #104

PYTHAGOREAN THEOREM

The **Pythagorean Theorem** is used to determine the measure of an unknown leg or hypotenuse of a right triangle.

$$a^2 + b^2 = c^2$$



PRAXIS FLASHCARD #322

PYTHAGOREAN TRIPLE

A **Pythagorean Triple** is a set of any three **integers** (a, b, c) such that $a^2 + b^2 = c^2$

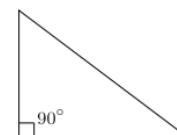
The three numbers of a Pythagorean Triple describe the length of the three sides of a right triangle. Perhaps the most well-known Pythagorean Triple is 3-4-5. There are 16 Pythagorean Triples with $c < 100$:

| | | | |
|--------------|--------------|--------------|--------------|
| (3, 4, 5) | (5, 12, 13) | (7, 24, 25) | (8, 15, 17) |
| (9, 40, 41) | (11, 60, 61) | (12, 35, 37) | (13, 84, 85) |
| (16, 63, 65) | (20, 21, 29) | (28, 45, 53) | (33, 56, 65) |
| (36, 77, 85) | (39, 80, 89) | (48, 55, 73) | (65, 72, 97) |

PRAXIS FLASHCARD #106

RIGHT TRIANGLE

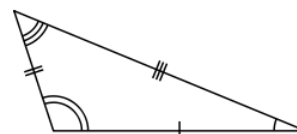
A **right triangle** is a triangle in which one angle is a right angle. The right angle is usually marked with a small square:



PRAXIS FLASHCARD #107

SCALENE TRIANGLE

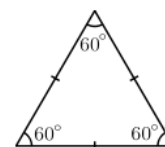
A **scalene triangle** is a triangle in which all three sides are of different length. In diagrams representing triangles (and other geometric figures), "tick" marks along the sides are used to denote sides of equal lengths:



PRAXIS FLASHCARD #126

EQUILATERAL TRIANGLE

An **equilateral triangle** is one where all three legs (sides) are of equal measure. An equilateral triangle is also **equiangular**, which all three angles are of equal measure (60°). In diagrams representing triangles (and other geometric figures), "tick" marks along the sides are used to denote sides of equivalent lengths:



PRAXIS FLASHCARD #127

ISOSCELES TRIANGLE

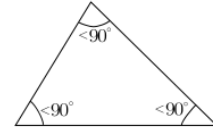
An **isosceles triangle** is one where two of the three legs (sides) are of equal measure, which means two of the angles are of equal measure. In diagrams representing triangles (and other geometric figures), "tick" marks along the sides are used to denote sides of equal lengths:



PRAXIS FLASHCARD #233

ACUTE TRIANGLE

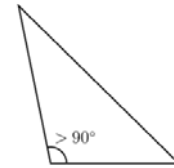
An **acute triangle** is any triangle where all three angles are less than 90°:



PRAXIS FLASHCARD #302

OBTUSE TRIANGLE

An **obtuse triangle** is a triangle where one of the angles is obtuse (greater than 90-degrees).



PRAXIS FLASHCARD #332

OBLIQUE TRIANGLE

Any triangle that is NOT a right triangle is an **oblique triangle**. As such, acute triangles and obtuse triangles are in the category of oblique triangles.

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SUM OF INTERIOR ANGLES

In a polygon, the **sum of the interior angles** is equal to the number of sides, subtract 2, and then multiply by 180°:

$$180(n - 2)^\circ$$

PRAXIS FLASHCARD #353

CLASSIFYING TRIANGLES

Triangles can be classified in two ways:

1. By the angles in the triangle: acute, obtuse, and right.
2. By the sides in the triangle: equilateral, isosceles, and scalene.

PRAXIS FLASHCARD #381

WHAT ARE THE THREE "SPECIAL RIGHT TRIANGLES"?

30°-60°-90°

45°-45°-90°

3n°-4n°-5n°