Geometry Info Sheet #35

Special Right Triangles (45-45-90 and 30-60-90)

Definitions

Square: A quadrilateral with four congruent sides and four right angles

Right Triangle: A triangle that contains a right interior angle

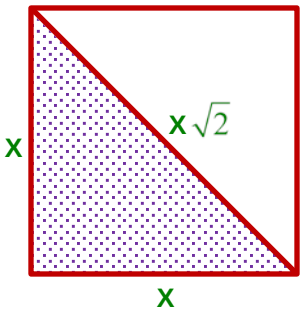
Isosceles Triangle: A triangle with at least two congruent sides

Equilateral Triangle: An isosceles triangle with three congruent sides

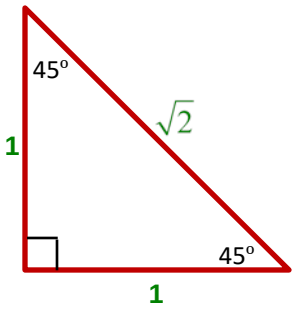
A **45°-45°-90° triangle** is a right isosceles triangle with interior angles of 45°, 45°, and 90°. It is half of a square. In a 45°-45°-90° triangle, both legs are congruent and the length of the hypotenuse is $\sqrt{2}$ times the length of a leg.

A **30°-60°-90° triangle** is a triangle with interior angles of 30°, 60°, and 90°. It is half of an equilateral triangle. In a 30°-60°-90° triangle, the length of the hypotenuse is twice the length of the shorter leg, and the length of the longer leg is $\sqrt{3}$ times the length of the shorter leg.

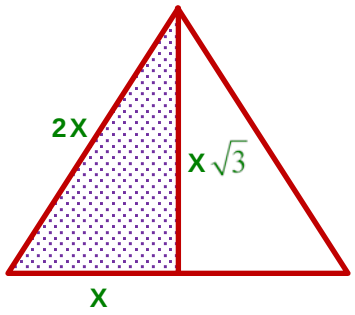
SQUARE



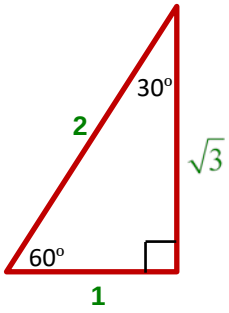
45°-45°-90°



EQUILATERAL TRIANGLE



30°-60°-90°



Theorems

Pythagorean Theorem: For any right triangle, the sum of the squares of the lengths of the legs is equal to the square of the length of the hypotenuse.

Converse of Pythagorean Theorem: If the square of the length of one side of a triangle is equal to the sum of the squares of the lengths of the other two sides, then the triangle is a right triangle.