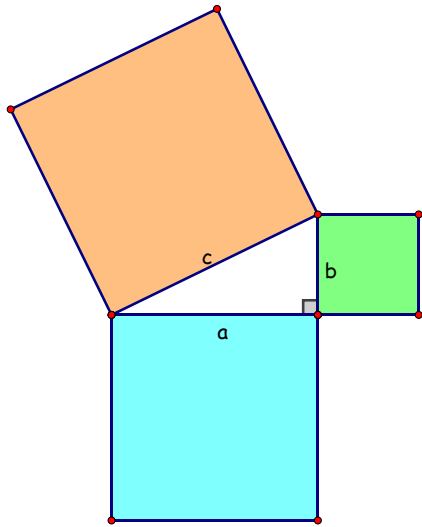


Objectives: Use the Pythagorean Theorem and its converse to solve problems. Use Pythagorean inequalities to classify triangles.

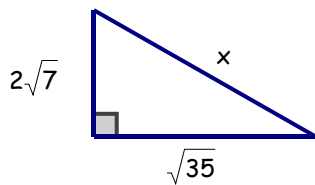
The Pythagorean Theorem is probably the most famous mathematical relationship. In a right triangle, the sum of the squares of the lengths of the legs equals the square of the length of the hypotenuse.



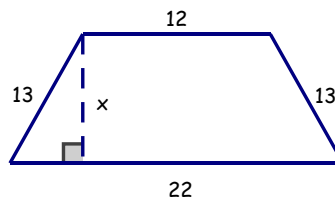
PythagoreanTriple –

Examples:

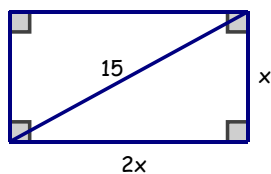
(a)



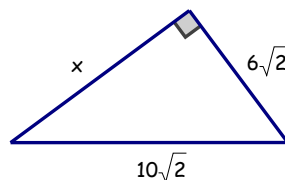
(b)



(c)



(d)



Word Problems:

(a) A 15-foot ladder is placed up against a house. The base of the ladder is 9 feet from the base of the house. How far up the house does the ladder reach?

(b) A flagpole that was originally 24 feet tall has cracked 9 feet from the ground and has fallen as if hinged. Find out how far from the base of the flagpole the top of the flagpole touched after it had fallen.

Pythagorean Inequalities Theorem –

Example: Tell if the measures can be the side lengths of a triangle. If so, classify the triangle as acute, obtuse, or right. SHOW WORK to justify your answer. DO NOT USE TRIPLES.

(a) 8, 11, and 13

(b) 6, 3, and $3\sqrt{3}$

(c) 7, 12, and 16