



Special Triangles

We should know the definitions for a)Scalene, b)Isosceles, c)Equilateral, d)Acute, e)Obtuse, and f)Right triangles.

We also need to know Properties of these triangle types.

There are two more Special Triangles we should know.

$$45^\circ - 45^\circ - 90^\circ$$

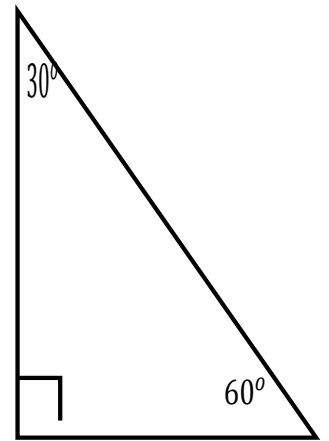
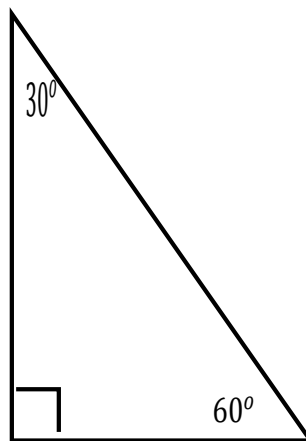
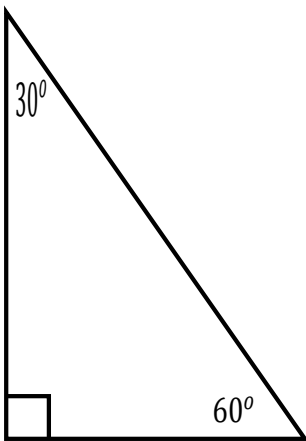
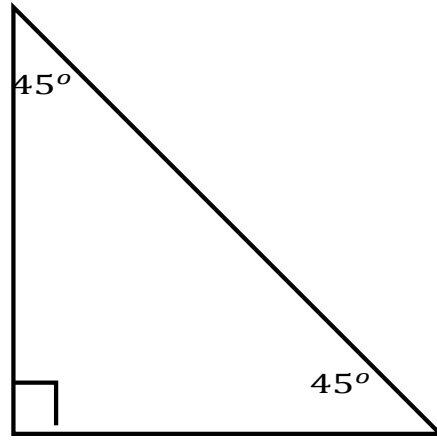
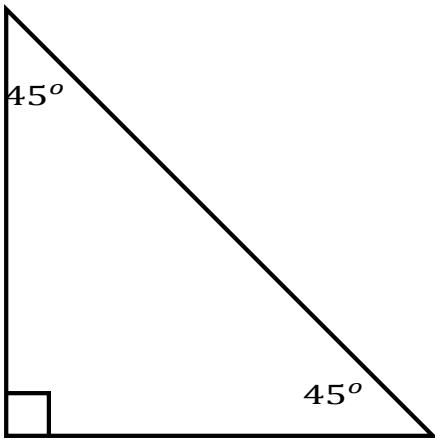
and

$$30^\circ - 60^\circ - 90^\circ$$



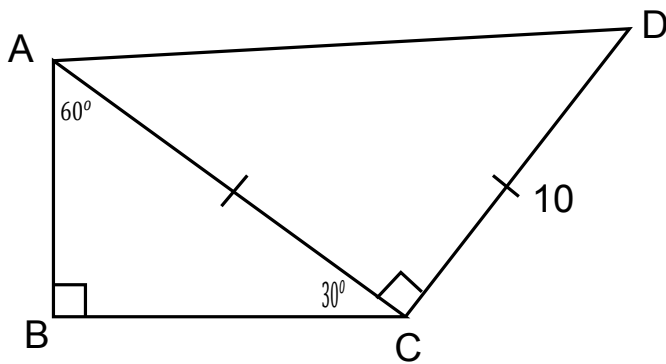
Example 1.

Find all the sides for any $45^\circ - 45^\circ - 90^\circ$ or $30^\circ - 60^\circ - 90^\circ$ triangles that have one side length 6.



Example 2.

Find the Perimeter and Area of ABCD.





Pythagorean Triples

Right angled triangles that have whole number sides have sides that are called Pythagorean Triples.

The most recognized is our 3,4,5 triangle.

You should also know the next two or three smallest triples. 5,12,13 7,24,25 and 8,15,17.

There is also a cool formula that allows you generate all sorts of Pythagorean Triples.

Take any two whole numbers a and b where $a > b$.

A Pythagorean Triple is formed by $2ab, a^2 - b^2, a^2 + b^2$.

For example.....

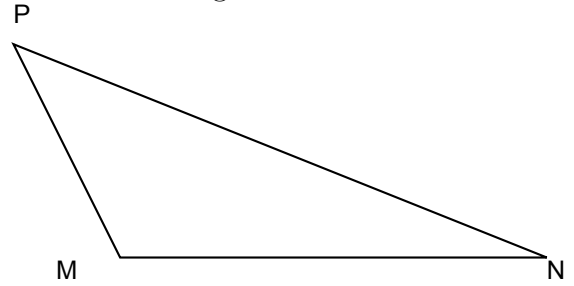
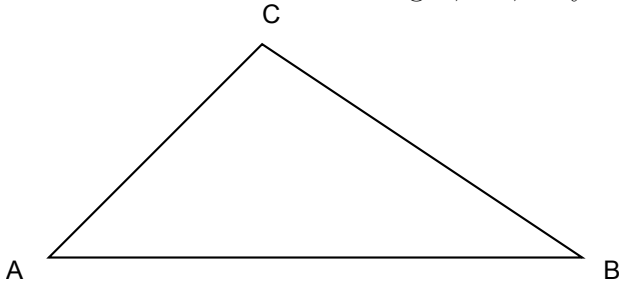
Can we show algebraically that $2ab, a^2 - b^2, a^2 + b^2$ always fits the Pythagorean Theorem?



Triangle Area

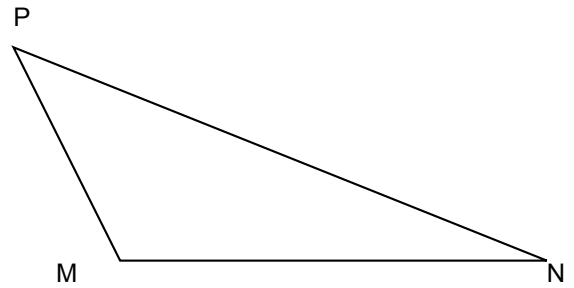
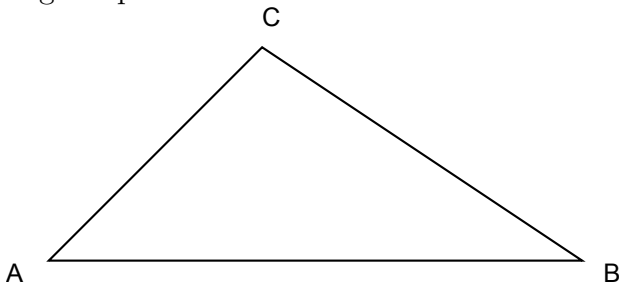
We certainly know the formula $A = \frac{bh}{2}$ or $A = \frac{1}{2}bh$.

Please remember that the height, "h", may be inside or outside the triangle.



You could also spend some time to learn or look up Pic's Theorem to find Triangle area.

An important property that is often used in Contest Mathematics comes from splitting triangles up.



Example: In $\triangle ABC$, $AB=12$, $BC=9$ and $AC=15$. D is the midpoint of AB . E is a point on AC such that the intersection of DC and BE splits BE into the ratio $2:1$. Find the area of $\triangle ADE$.