

Geometry 1

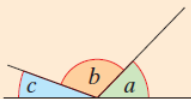
chapter

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Section 3.1 Angles, triangles and parallelograms

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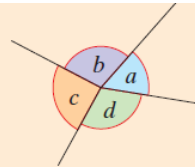
$$a + b + c = 180^\circ$$

Angles which meet at a point on a straight line add up to 180° .



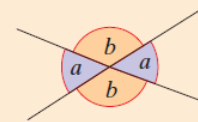
$$a + b = 180^\circ$$

A pair of angles that add together to make 180° are called **supplementary angles**.



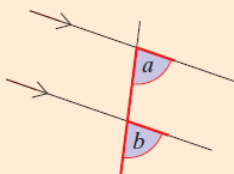
$$a + b + c + d = 360^\circ$$

Angles which meet at a point add up to 360° .

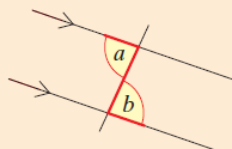


When two lines intersect, **vertically opposite angles** are equal in measure.

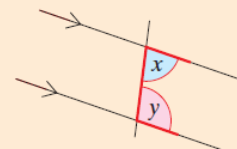
Angles formed when a straight line crosses a pair of parallel lines have the following properties:



Corresponding angles are equal.
 So $a = b$.
 You can find them by looking for an F shape.

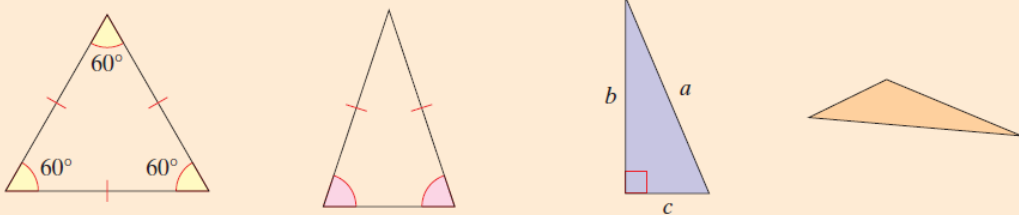


Alternate angles are equal.
 So $a = b$.
 Look for a Z shape.



The **interior angles** x and y sum to 180° .
 $x + y = 180^\circ$.

Triangles and their properties



An **equilateral triangle** has:

- 3 sides equal
- 3 interior angles equal (60°)

An **isosceles triangle** has:

- 2 sides equal
- base angles equal

A **right-angled triangle** has:

- 1 angle of 90°
- $a^2 = b^2 + c^2$

Triangles with no equal angles and no equal sides are called **scalene triangles**.

The angles of a triangle sum to 180° .

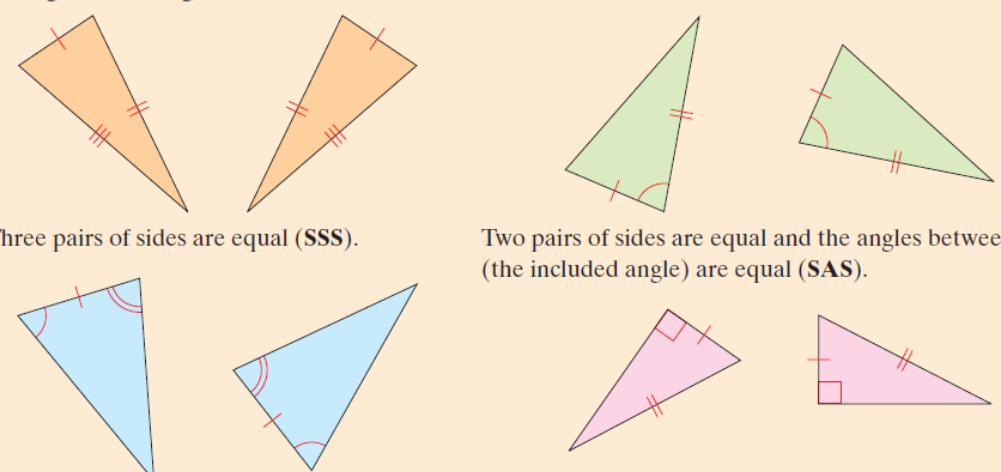
$\angle A + \angle B + \angle C = 180^\circ$

The **exterior angle** of a triangle is equal to the sum of the interior opposite angles.

$\angle C = \angle A + \angle B$

Congruent triangles

Triangles are congruent if one of these conditions is true:



Three pairs of sides are equal (**SSS**).

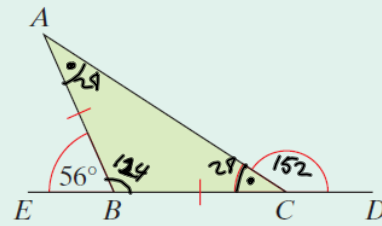
Two pairs of sides are equal and the angles between them (the included angle) are equal (**SAS**).

Two pairs of angles are equal and the sides between them are equal (**ASA**).

Both triangles have a right angle, the hypotenuses are equal and one pair of corresponding sides is equal (**RHS**).

Example 1

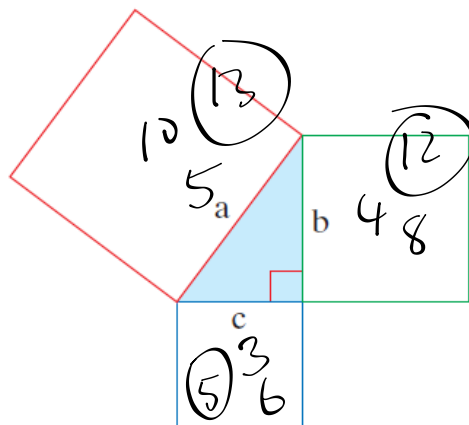
In the given triangle, $|AB| = |BC|$, and $|\angle ABE| = 56^\circ$.
 Find (i) $|\angle ACB|$ (ii) $|\angle ACD|$.



Theorem of Pythagoras

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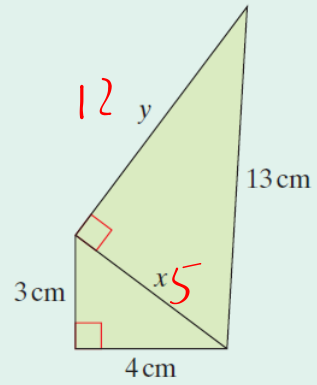
In a right-angled triangle, the area of the square drawn on the hypotenuse is equal to the sum of the areas of the squares on the other two sides.



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

Example 2

Calculate the lengths marked x and y .



2. Find the size of the angle marked with a letter in each of the following triangles where equal sides are marked:

