

Common Core Standards - Resource Page

The resources below have been created to assist teachers' understanding and to aid instruction of this standard.

Domain	Standard: G.CO.10 - Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180° ; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.
<u>Congruence</u> Prove geometric theorems	<p><u>Questions to Focus Learning</u></p> <p>What relationships among angles, sides, and other segments in a triangle are always true?</p> <p>In triangles, certain relationships among angles, sides, and other segments are always true.</p> <p><u>Student Friendly Objectives</u></p> <p><i>Knowledge Targets</i></p> <ul style="list-style-type: none"> I can classify triangles by their sides and angles. I can identify two parallel lines. I can identify the midpoint of a segment. I can identify the base and base angles of isosceles triangles. I can identify the midsegments of a triangle. I know the sum of the interior angles of a triangle is 180 degrees. <p><i>Reasoning Targets</i></p> <ul style="list-style-type: none"> I can prove the triangle sum theorem. I can prove the exterior angle theorem. I can prove the base angles (and two sides) of an isosceles triangle are congruent (and the converse). I can prove an equilateral triangle is equiangular (and the converse). I can prove the segment joining midpoints of two sides of a triangle are parallel to the third side and half the length. I can prove the medians of a triangle meet at the centroid. I can prove the perpendicular bisectors of a triangle meet at the circumcenter. I can prove the altitudes of a triangle meet at the orthocenter. I can prove the angle bisectors of a triangle meet at the incenter. I can apply the triangle sum theorem. I can apply the exterior angle theorem. I can apply the fact that the base angles of an isosceles triangle are congruent (and the converse). I can apply the fact that the segment joining midpoints of two sides of a triangle are parallel to the third side and half the length.

Vocabulary

acute triangle
base
base angles
centroid
circumcenter
equiangular triangle
equilateral triangle
exterior angle
hypotenuse
incenter
interior angle
isosceles triangle
leg
midsegment
obtuse triangle
orthocenter
scalene triangle
remote angle
right triangle
vertex angle

Teacher Tips

Encourage multiple ways of writing proofs, such as in narrative paragraphs, using flow diagrams, in two-column format, and using diagrams without words. Students should be encouraged to focus on the validity of the underlying reasoning while exploring a variety of formats for expressing that reasoning. Implementation of G.CO.10 may be extended to include concurrence of perpendicular bisectors and angle bisectors as preparation for G.C.3.

Proof of concurrency of the medians (or altitudes or perpendicular bisectors) of a triangle is best accomplished using coordinate geometry (see G.GPE.4).

Vertical Progression

G.CO.11 - Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.

The above information and more can be accessed for free on the [Wiki-Teacher](#) website.
Direct link for this standard: [G.CO.10](#)