

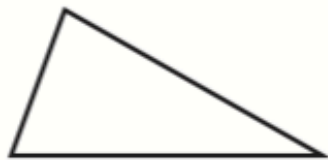
4.1 Triangles

KEY CONCEPT

For Your Notebook

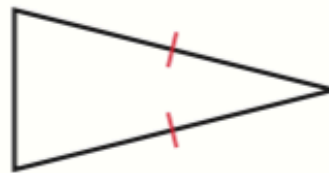
Classifying Triangles by Sides

Scalene Triangle



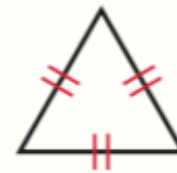
No congruent sides

Isosceles Triangle



At least 2 congruent sides

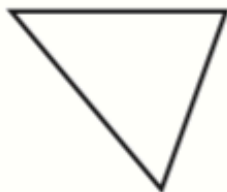
Equilateral Triangle



3 congruent sides

Classifying Triangles by Angles

Acute Triangle



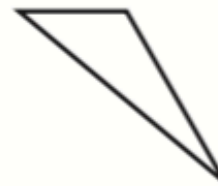
3 acute angles

Right Triangle



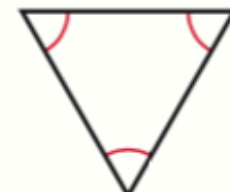
1 right angle

Obtuse Triangle



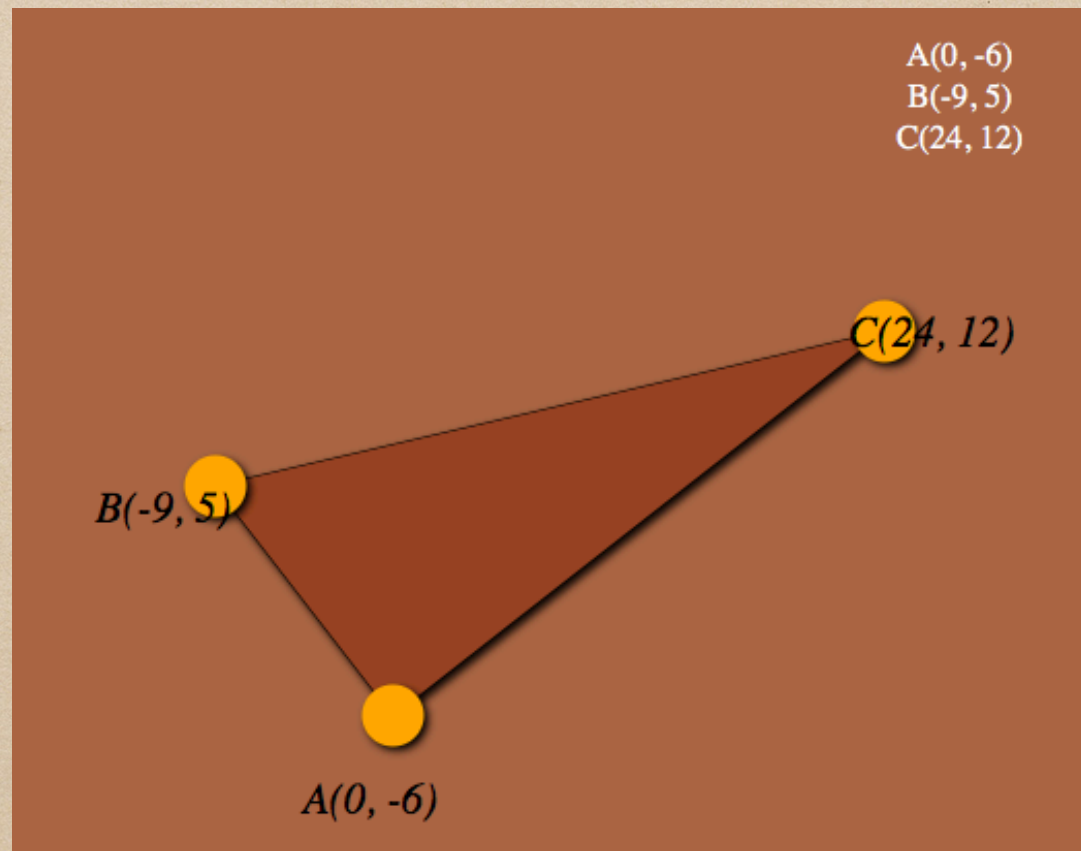
1 obtuse angle

Equiangular Triangle



3 congruent angles

<https://www.mathorama.com/geom/glabs/TriangleApp.html>



Use slopes to check if it is a right triangle

Equivalent to Euclid's Parallel Postulate
(John Playfair's axiom)

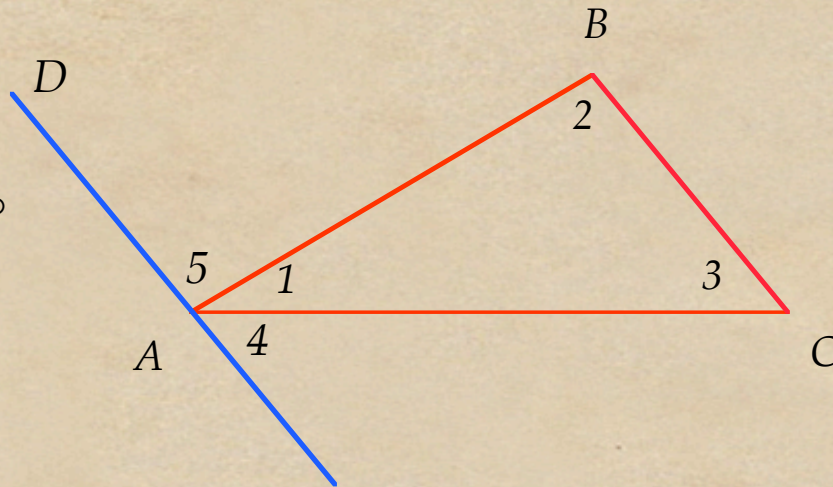


Through a point outside a line,
there is exactly one line parallel.

Theorem: The Sum of the Interior Angles of a Triangle is 180°

Given: $\triangle ABC$

Prove: $\angle 1 + \angle 2 + \angle 3 = 180^\circ$



Draw D so $\overline{DA} \parallel \overline{BC}$

$$\angle 5 \cong \angle 2$$

$$\angle 4 \cong \angle 3$$

$$m\angle 4 + m\angle 1 + m\angle 5 = 180^\circ$$

$$m\angle 1 + m\angle 2 + m\angle 3 = 180^\circ$$

Through a point outside a line,
here is exactly one line \parallel

Alt Int \angle 's s are \cong

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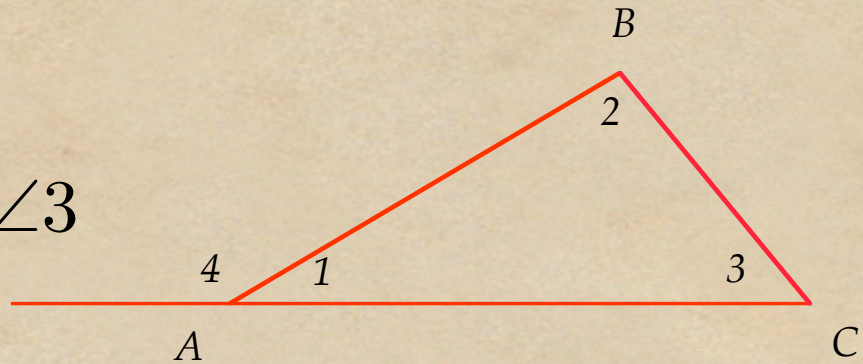
Def. Supp.

Subst.

Exterior Angle Theorem

Given: $\triangle ABC$

Prove: $m\angle 4 = m\angle 2 + m\angle 3$



$$m\angle 1 + m\angle 2 + m\angle 3 = 180^\circ$$

$$m\angle 1 + m\angle 4 = 180^\circ$$

$$m\angle 1 + m\angle 4 = m\angle 1 + m\angle 2 + m\angle 3$$

$$m\angle 4 = m\angle 2 + m\angle 3$$

$$\triangle = 180^\circ$$

Def. Supp.

Trans.

Subtr.