

Geometry

Chapter 3
Section 3-5

Vocabulary

Auxiliary Line

Line that **you** add to a diagram, to help an explanation or proof

Exterior Angle
(Polygon)

Angle formed by a side and an extension of an adjacent side
****Must be adjacent to interior angle**

Remote Interior Angle
(Triangle)

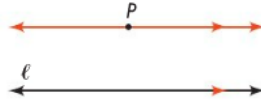
The two interior angles not adjacent to a given exterior angle

Parallel Postulate

Take note

Postulate 3-2 Parallel Postulate

Through a point not on a line, there is one and only one line parallel to the given line.



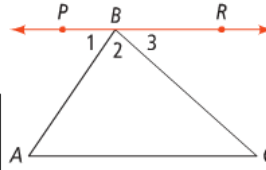
There is exactly one line through P parallel to l .

Using Auxiliary Lines

Proof of Theorem 3-11: Triangle Angle-Sum Theorem

Given: $\triangle ABC$

Prove: $m\angle A + m\angle B + m\angle C = 180$



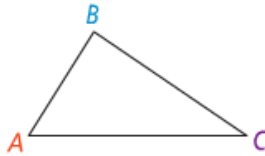
$\triangle ABC$	Given
$\angle 1 \cong \angle A, \angle 3 \cong \angle C$	Alternate Interior Angles
$m\angle 1 = m\angle A, m\angle 3 = m\angle C$	Def of Congruence
$m\angle 1 + m\angle 2 + m\angle 3 = 180$	Angle Addition
$m\angle A + m\angle B + m\angle C = 180$	Substitution

Triangle Sum Theorem

take note

Theorem 3-11 Triangle Angle-Sum Theorem

The sum of the measures of the angles of a triangle is 180.

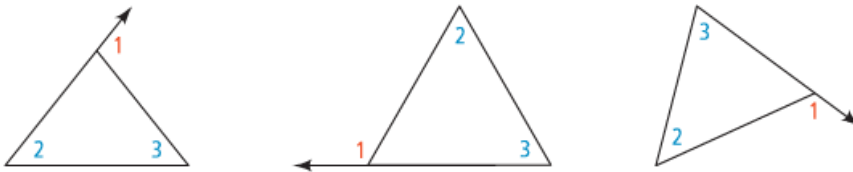


$$m\angle A + m\angle B + m\angle C = 180$$

Exterior Angles and Remote Interior Angles

Angle 1 is an exterior angle

Angles 2 and 3 are remote interior angles of angle 1



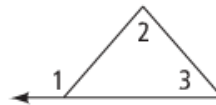
Exterior Angles Theorem

Take note

Theorem 3-12 Triangle Exterior Angle Theorem

The measure of each exterior angle of a triangle equals the sum of the measures of its two remote interior angles.

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



***To be proven on the homework (#33)*

Using the Exterior Angles Theorem

$$m \angle 1 = 106^\circ$$

$$m \angle 2 = 46^\circ$$

$$m \angle 3 = ??$$

$$m \angle 1 = (4x-11)^\circ$$

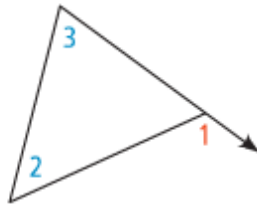
$$m \angle 2 = (x+19)^\circ$$

$$m \angle 3 = (2x)^\circ$$

$$m \angle 1 = 122^\circ$$

$$m \angle 2 = (x+5)^\circ$$

$$m \angle 3 = (x-5)^\circ$$



$$m \angle 3 = 60$$

$$x = 30$$

$$m \angle 1 = 109$$

$$m \angle 2 = 49$$

$$m \angle 3 = 60$$

$$x = 61$$

$$m \angle 2 = 66$$

$$m \angle 3 = 56$$

Homework

Pages 175-176

10, 12, 16, 18, 20, 26, 28, 32, 33