8.2 The triangle Sum Thm

Figuring out angle sums of specific polygons as well as angle measures in relation to triangles

Parallel Postulate

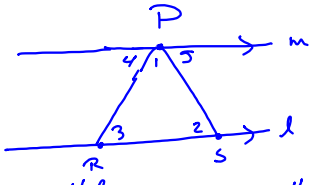
P

m

l

For all points P not on line l there is exactly one line through P that is parallel to l

P is on line m and m ∥ l



m ∥ l

$m\angle 3 = m\angle 4$ Alt Int ∠'s

$m\angle 2 = m\angle 5$ Alt Int ∠'s

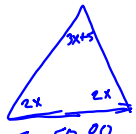
$m\angle 1 + m\angle 5 + m\angle 4 = 180°$ straight ∠ Pos

$m\angle 1 + m\angle 2 + m\angle 3 = 180°$ substitution

The Triangle Sum Thm

- The sum of the three angles in a triangle is 180°

$m\angle 1 + m\angle 2 + m\angle 3 = 180°$



50, 50, 80

use to find angle measures

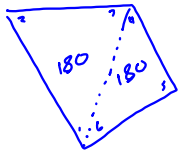
$3x + 5 + 2x + 2x = 180$

$7x + 5 = 180$

$7x = 175$

$x = 25$

Using triangles to find angle measures of other polygons

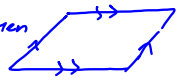


Quadrilateral Sum Thm

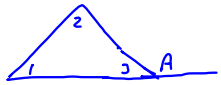
- The sum of the four angles in a quadrilateral is 360°

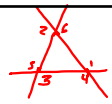
$m\angle 1 + m\angle 2 + m\angle 3 + m\angle 4 = 360°$

Like parallel converses
there are parallelogram converses

If  then 

showing stuff is the same
when dividing into 2 triangles





$m\angle 1 + m\angle 2 + m\angle 3 = 180$
$m\angle A + m\angle 3 = 180$
$m\angle 1 + m\angle 2 = 180 - m\angle 3$
$m\angle A = 180 - m\angle 3$
$m\angle 1 + m\angle 2 = m\angle A$

Exterior Angle Thm

Exterior Angle - An angle formed when the side of a polygon is extended

The measure of the exterior angle of a triangle is equal to the sum of the two nonadjacent angles

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