

$m\angle 1$	$m\angle 2$	$m\angle 3$	$m\angle 4$	$m\angle 5$	$m\angle 3 + m\angle 4 + m\angle 5$
60	40	80	60	40	180
50	50				
81	37	62	81	37	180
44	51				



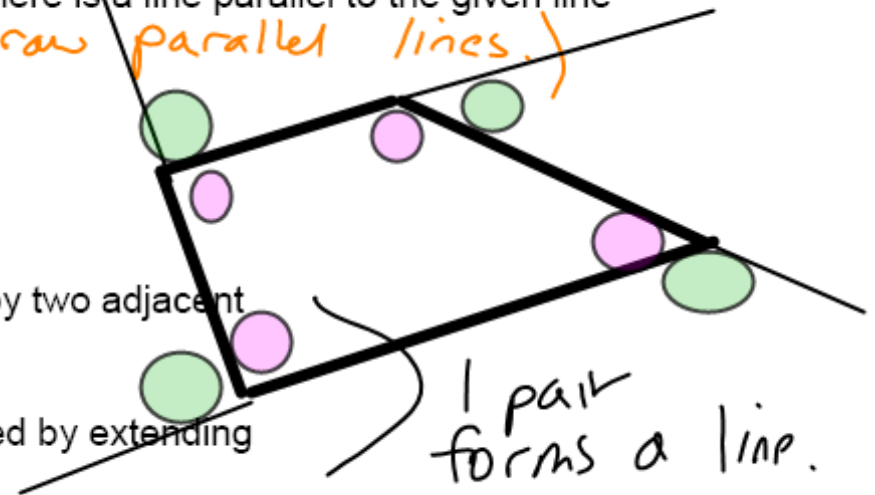
Parallel Postulate: Given any line and a point not on the line, there is a line parallel to the given line through the given point. *(we can draw parallel lines.)*

Polygon: A connected, plane figure.

Triangle: A three-sided polygon.

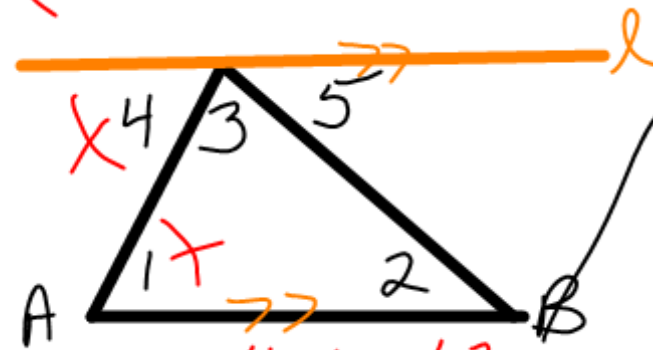
Interior Angles of Polygons: Angles inside a polygon which are formed by two adjacent sides of the polygon.

Exterior Angles of Polygons: An angle outside a polygon which are formed by extending a side of the polygon.



Triangle Interior Angles Theorem: In a triangle, the sum of the measures of the interior angles is 180°

(TIAT)



Given: $\angle 1, \angle 2, \angle 3$ are the angles of a \triangle .

- ①
- ② Draw l parallel to the base of the triangle (\overline{AB})
- ③ $\angle 3, \angle 4, \angle 5$ form a line





S | R

- ① Given
- ② Parallel Postulate
- ③ Given
- ④ Alt. Int. \angle s
- ⑤ TIAT
- ⑥ Def of \angle s
- ⑦ Substitution

Prove: $m\angle 1 + m\angle 2 + m\angle 3 = 180$.

- ④ $\angle 1 \cong \angle 4; \angle 2 \cong \angle 5$
- ⑤ $m\angle 4 + m\angle 5 + m\angle 3 = 180$
- ⑥ $m\angle 1 = m\angle 4; m\angle 2 = m\angle 5$
- ⑦ $m\angle 1 + m\angle 2 + m\angle 3 = 180$

Convex Polygon

Polygon	# sides	# triangles	Sum of Measures of Interior Angles
	3	1	180
	4	2	360 $2 \cdot 180$
	5	3	540 $3 \cdot 180$
	6	4	720 $4 \cdot 180$
Heptagon	7	5	900 $5 \cdot 180$
n-gon	n	$(n-2)$	$(n-2) \cdot 180$

Concave Polygon

Sum of the Measures of the Interior Angles in an "n-sided" Polygon:

$$(n-2) 180$$

[EX1]

Find the sum of the measures of the interior angles of a 132-gon.

$$132 \circ 180 = \underline{\underline{23,400}}^{\circ}$$

[EX2]

The sum of the measures of the interior angles of a polygon is 322,020 degrees. How many sides does the polygon have?

$$\frac{(n-2)180}{180} = \frac{322020}{180}$$

$$n-2 = 1789$$

$$\boxed{n = 1791}$$