FoM11 Lesson 2.3

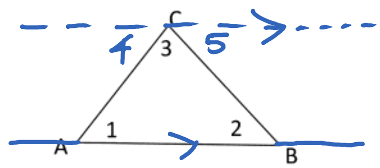
Monday, February 27, 2017 10:04 AM

FOM 11 **2.3 Angle Properties In Triangles**

The sum of the angles in a triangle is 180°.

We can use our knowledge of parallel lines to prove (deductively) this theorem.

Example 1: Given ΔABC, prove $\angle 1 + \angle 2 + \angle 3 = 180°$.



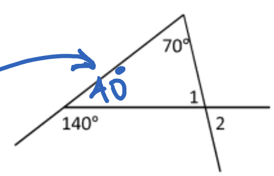
$\angle 1 = \angle 4$ alt. int. $\angle$'s

$\angle 2 = \angle 5$ alt. int. $\angle$'s

$\angle 3 + \angle 4 + \angle 5 = 180°$ $\angle$'s on line

$\boxed{\angle 3 + \angle 1 + \angle 2 = 180°}$ substitution

Example 2: Determine the measures of $\angle 1$ and $\angle 2$.



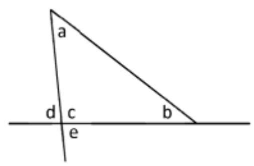
b/c $\angle$'s on line

$\angle 1 = 70°$ $\angle$ sum Δ

$\angle 2 = 70°$ vert opp $\angle$'s

The measure of an exterior angle of a triangle is equal to the sum of the measures of the two non-adjacent interior angles.

Example 3: Prove $\angle e = \angle a + \angle b$.



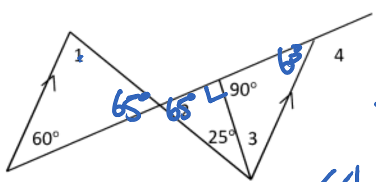
$\angle e + \angle c = 180^\circ$ ∠'s on line

$\angle a + \angle b + \angle c = 180^\circ$ ∠ sum △

$\angle e = 180^\circ - \angle c$ $\quad$ $\angle a + \angle b = 180^\circ - \angle c$

$\angle e = \angle a + \angle b$

Example 4: Determine $\angle 1$, $\angle 2$, $\angle 3$, and $\angle 4$.



$\angle 2 = 65^\circ$ ∠ sum △

$\angle 1 = 55^\circ$ ∠ sum △

$\angle 4 = 120^\circ$ ∠'s on line

$\angle 3 + 25^\circ = 55^\circ$ alt. int. ∠'s

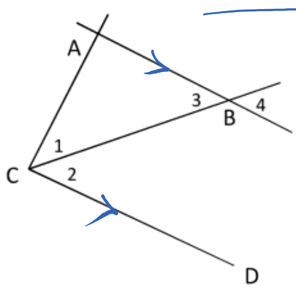
$\angle 3 = 30^\circ$

or

$\angle 3 = 180^\circ - 90^\circ - 60^\circ$
$= 30^\circ$
∠ sum △

parallel

Example 5: Given $AB \parallel CD$
and
$\angle 1 = \angle 4$
Prove $\angle 1 = \angle 2$



statement	Reason
$AB \parallel CD$	Given
$\angle 2 = \angle 4$	corresponding ∠'s
$\angle 1 = \angle 4$	Given
$\angle 2 = \angle 1$	both = ∠4

Assignment: pg. 90 #2, 3, 5-9, 12, 15, 16, 18
optional