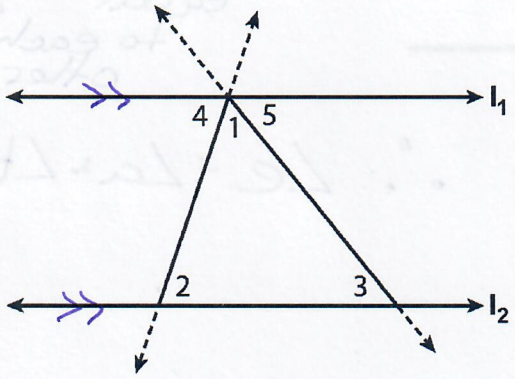
Lesson #2.3 – Angles Properties of Triangles

The sum of angles in a triangle equals 180°

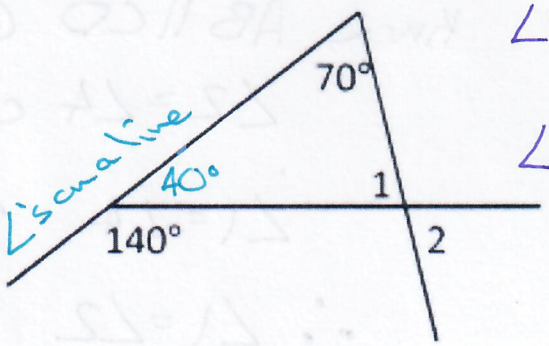
We can use our knowledge of parallel lines to prove (deductively) this theorem.

Proof:



$\angle 2 = \angle 4$ alternate interior $\angle$s
$\angle 3 = \angle 5$ " " "
$\angle 4 + \angle 1 + \angle 5 = 180°$ angles on a line.
substitution
$\angle 2 + \angle 1 + \angle 3 = 180°$

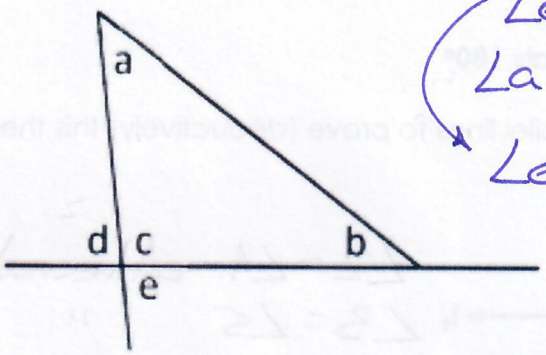
Example 2: Find the measure of ∠1 and ∠2.



$\angle 1 = 180° - 70° - 40° = 70°$
sum of $\angle$s in $\triangle$
$\angle 1 = \angle 2 = 70°$ vertically opposite $\angle$s

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

Example 3: Prove ∠e = ∠a + ∠b



$\angle e + \angle c = 180°$ ∠'s on a line

$\angle a + \angle b + \angle c = 180°$ Σ of ∠'s in Δ

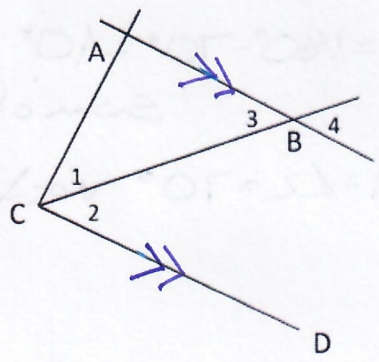
$\angle e = 180° - \angle c$ → $\angle a + \angle b = 180° - \angle c$

equal to each other

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

Parallel

Example 4: Given AB ∥ CD and ∠1 = ∠4, Prove ∠1 = ∠2



Know AB ∥ CD "Given"

$\angle 2 = \angle 4$ corresponding angles

$\angle 1 = \angle 4$ "Given"

$\therefore \angle 1 = \angle 2$ both are = ∠4

Practice Questions: Page 90, #'s 2, 3, 5-9, 12, 15, 16*, 18*