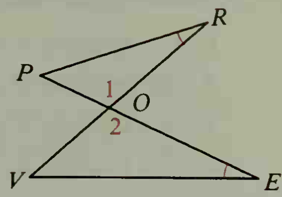
In the classroom exercises you will explain how these corollaries follow from Theorem 3-11.

Example 1 Is $\angle P \cong \angle V$?

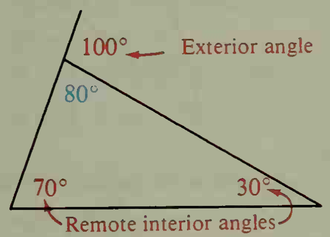
Solution $\angle R \cong \angle E$ (Given in diagram)

$\angle 1 \cong \angle 2$ (Vertical angles are congruent.)

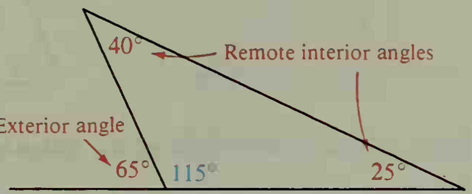
Thus two angles of $\triangle PRO$ are congruent to two angles of $\triangle VEO$, and therefore $\angle P \cong \angle V$ by Corollary 1.



When one side of a triangle is extended, an *exterior angle* is formed as shown in the diagrams below. Because an exterior angle of a triangle is always a supplement of the adjacent interior angle of the triangle, its measure is related in a special way to the measure of the other two angles of the triangle, called the *remote interior angles*.



$100 = 70 + 30$



$65 = 40 + 25$

Theorem 3-12

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

The proof of Theorem 3-12 is left as Classroom Exercise 15.

Example 2 In $\triangle ABC$, $m\angle A = 120$ and an exterior angle at C is five times as large as $\angle B$. Find $m\angle B$.

Solution Let $m\angle B = x$.

Draw a diagram that shows the given information.

Then apply Theorem 3-12.

$$\begin{aligned} 5x &= 120 + x \\ 4x &= 120 \\ x &= 30 \\ m\angle B &= 30 \end{aligned}$$