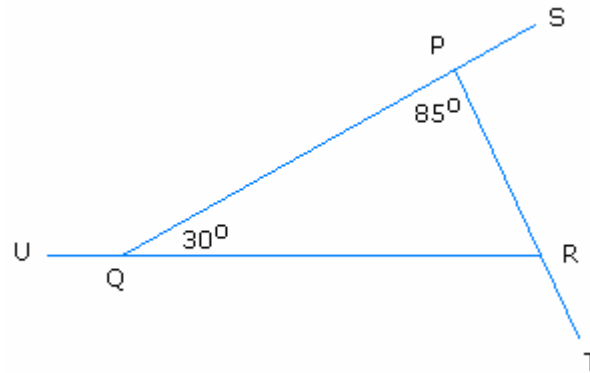


CHAPTER 7 Geometric Relationships  
 7.1 Angle Relationships in Triangles  
 Interior and Exterior Angle Relationships for Triangles

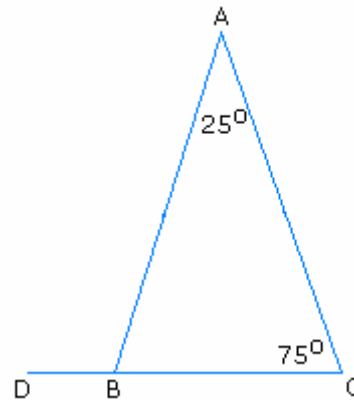
The sum of the exterior angles of a triangle is  $360^\circ$ .  
 The exterior angle at each vertex of a triangle is equal to the sum of the interior angles at the other two vertices.

**Example:**

a) Find the measures of the exterior angles of  $\triangle PQR$ .



b) Find the measure of  $\angle ABD$ .



**Solution:**

a)

$$\begin{aligned}\angle SPR + 85^\circ &= 180^\circ \\ \angle SPR + 85^\circ - 85^\circ &= 180^\circ - 85^\circ \\ \angle SPR &= 95^\circ\end{aligned}$$

$$\begin{aligned}\angle PQU + 30^\circ &= 180^\circ \\ \angle PQU + 30^\circ - 30^\circ &= 180^\circ - 30^\circ \\ \angle PQU &= 150^\circ\end{aligned}$$

$$\begin{aligned}\angle TRQ + \angle SPR + \angle PQU &= 360^\circ \\ \angle TRQ + 95^\circ + 150^\circ &= 360^\circ \\ \angle TRQ + 95^\circ + 150^\circ - 95^\circ - 150^\circ &= 360^\circ - 95^\circ - 150^\circ \\ \angle TRQ &= 115^\circ\end{aligned}$$

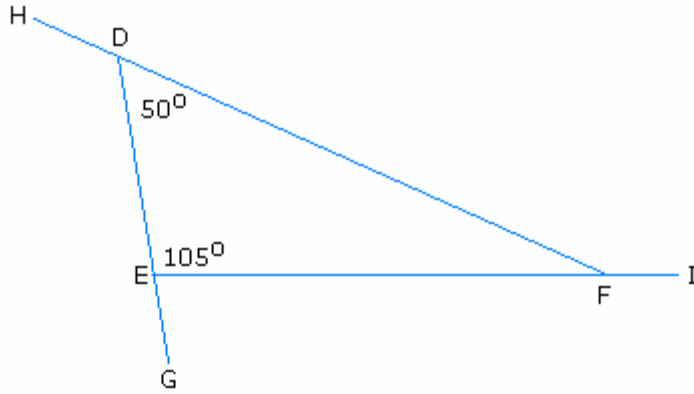
The measures of the exterior angles are  $\angle SPR = 95^\circ$ ,  $\angle PQU = 150^\circ$ , and  $\angle TRQ = 115^\circ$ .

b)  $\angle ABD = 25^\circ + 75^\circ$   
 $= 100^\circ$

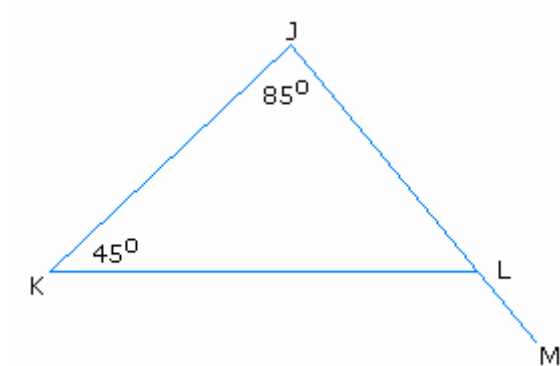
The measure of  $\angle ABD = 100^\circ$ .

**Practice:**

1. a) Find the measures of the exterior angles of  $\triangle DEF$ .



b) Find the measure of  $\angle KLM$ .



**Answers:**

1. a)  $\angle GEF = 75^\circ$ ,  $\angle HDE = 130^\circ$ , and  $\angle IFD = 155^\circ$ .

b)  $\angle KLM = 130^\circ$