Q7 P is a point inside the equilateral triangle ABC. $\angle APB = 113°$, $\angle BPC = 123°$. Prove that AP, BP and CP can from a triangle, and find all interior angles of this triangle.

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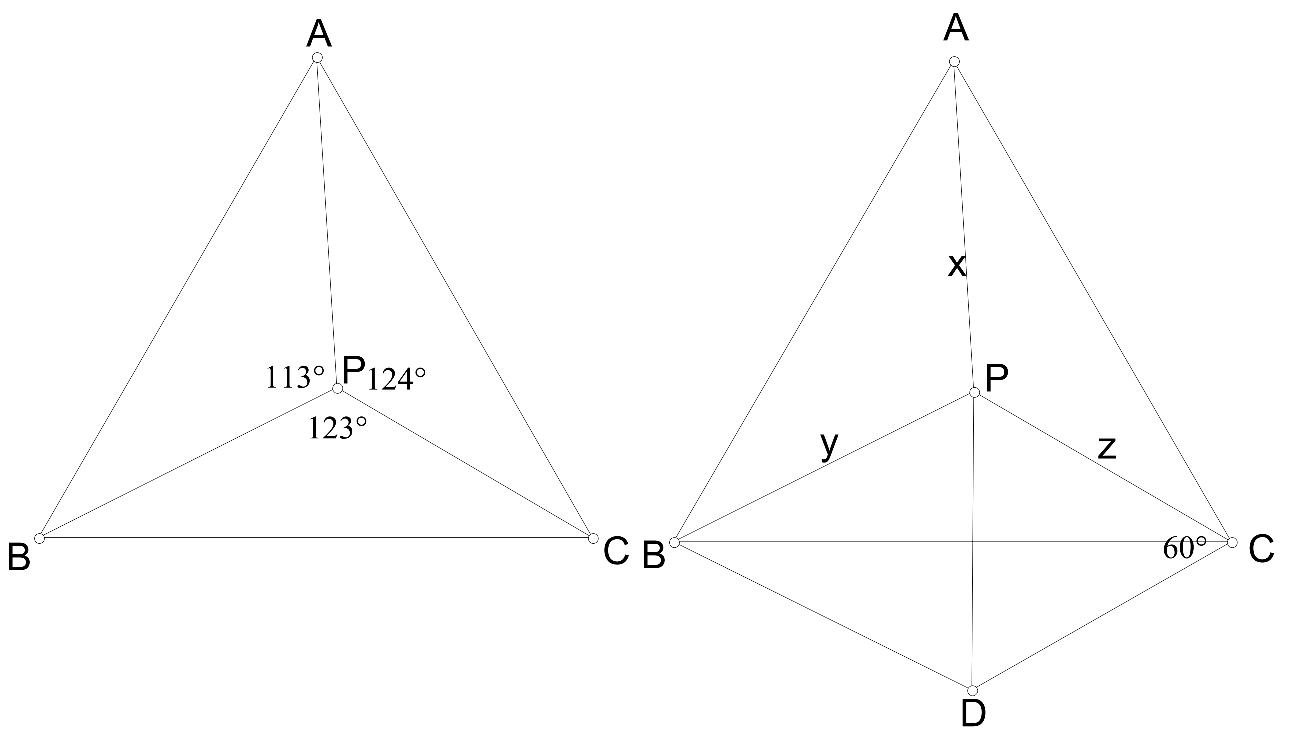

Rotate ΔAPC clockwise about C by 60° to ΔBDC. Let $AP = x$, $BP = y$, $CP = z$.

ΔCDP is an isosceles triangle, $CD = CP = z$, $\angle DCP = 60°$

$\therefore \angle CDP = \angle CPD = 60° \Rightarrow \Delta CDP$ is an equilateral triangle.

$DP = z$

$BD = x$ (property of rotation)

A triangle BDP is formed with AP, BP, CP as sides.

$\angle BPD = 123° - 60° = 63°$

$\angle BDP = 124° - 60° = 64°$

$\angle DBP = 180° - 63° - 64° = 53°$