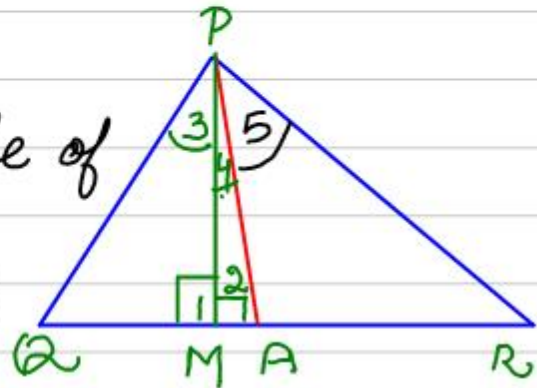


to prove $\angle APM = \frac{1}{2}(\angle Q - \angle R)$

proof $\angle 1$ is exterior angle of $\triangle PMR$

$$\therefore \angle 1 = \angle 4 + \angle 5 + \angle R \dots \textcircled{i}$$



$\angle 2$ is exterior of angle of $\triangle PMA$

$$\therefore \angle 2 = \angle 3 + \angle 4 \dots \textcircled{ii}$$

$$\angle 1 = \angle 2 = 90^\circ \dots \textcircled{iii}$$

from \textcircled{i} , \textcircled{ii} , \textcircled{iii}

$$\angle 4 + \angle 5 + \angle R = \angle 3 + \angle 4$$

$$\text{but } \angle 5 = \angle 3 + \angle 4$$

$$\angle 4 + \angle 3 + \angle 4 + \angle R = \angle 3 + \angle 4$$

$$\Rightarrow 2\angle 4 + \cancel{\angle 3} + \angle R = \cancel{\angle 3} + \angle 4$$

$$\Rightarrow 2\angle 4 = \angle R - \angle R$$

$$\Rightarrow \angle 4 = \frac{1}{2}(\angle Q - \angle R)$$

$$\Rightarrow \angle APM = \frac{1}{2}(\angle Q - \angle R)$$