Problem

In scalene triangle $ABC, AQ = PQ, MP = PN, PM \perp AB, PN \perp AC$. The correct one of the followings is

(1) $AN = AM$;

(2) $QP//AM$;

(3) $\triangle BMP \cong \triangle QNP$.

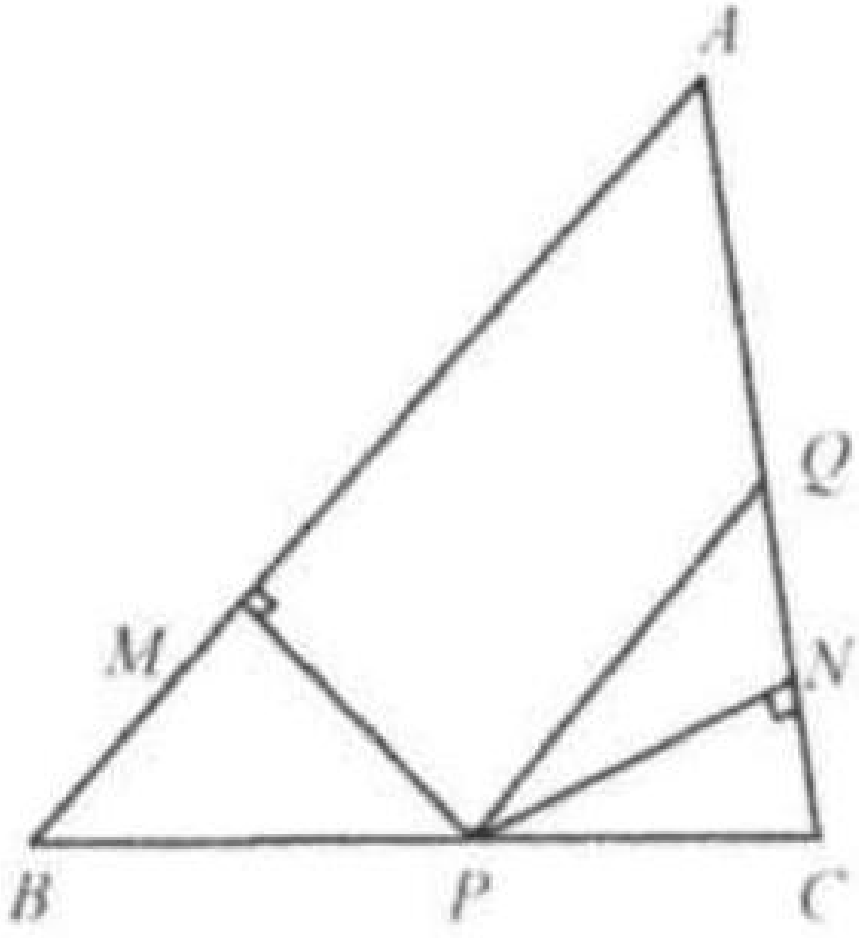
(A) all are correct

(B) only (1) and (2) are correct

(C) only (2) and (3) are correct

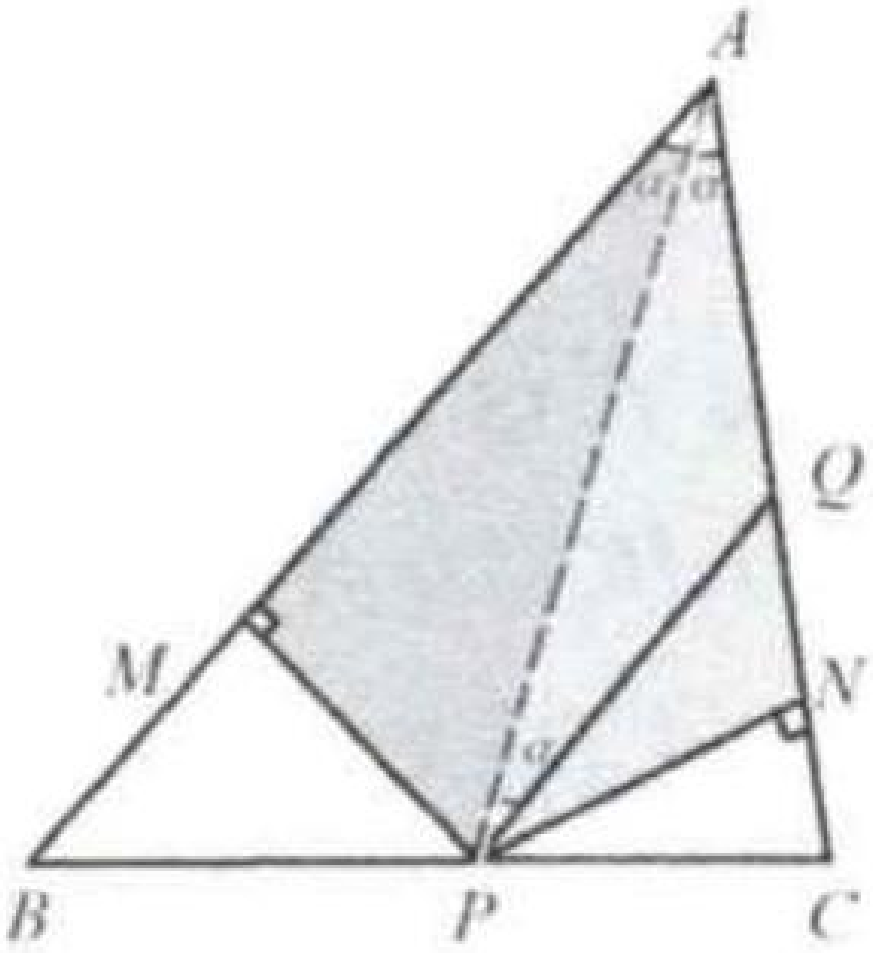
(D) only (1) is correct

(E) none is correct



Solution

(B). Connect AP. Since $MP = PN$ and $PM \perp AB$, AP is the angle bisector of $\angle A$. We also know that $AQ = PQ$.
So $\angle APQ = \angle QAP = \angle PAM = \alpha$.
Thus, $QP//AM$.
Since $\triangle APM$ and $\triangle APN$ are congruent ($AN = AM, MP = PN$, and $\angle AMP = \angle ANP = 90^\circ$),



So $AN = AM$.
If $\triangle BMP \cong \triangle QNP$, then $BP - PQ = AQ, \angle B = \angle QPC = \angle PQC$. Then we will have $PC = QC, BC = AC$. Triangle ABC is not a scalene triangle anymore.
So only (1) and (2) are correct.