



**Example 29 :** As shown in Figure 1, the parallelogram  $ABCD$ ,  $M$  and  $N$  are the midpoints of  $BC$  and  $CD$  respectively,  $AM$  intersects  $BN$  at  $R$ ,  $DM$  intersects  $BN$  at  $Q$ ,  $AN$  intersects  $DM$  at  $P$ , to prove:  $A, R, Q, P$  are concyclic. The necessary and sufficient condition for point cocircle is  $BA \perp BC$ .

Proof: Suppose 
$$\frac{A - \frac{A+C-B+C}{2}}{\frac{A - \frac{B+C}{2}}{A+C-B - \frac{B+C}{2}}} = t, \quad \left( \frac{B-C}{B-A} \right)^2 = s, \quad 1 - 4t - 4s + ts = 0,$$