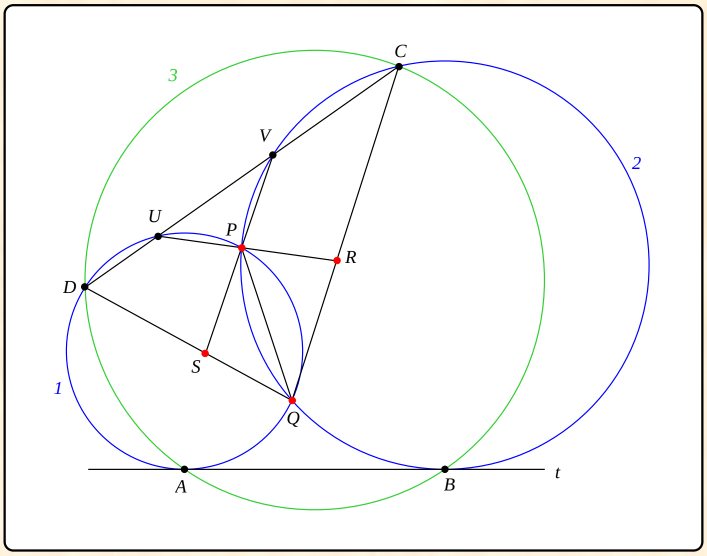
Four concyclic points*

Jean-Louis Ayme, Ercole Suppa

October 2, 2016

VISION

Figure:

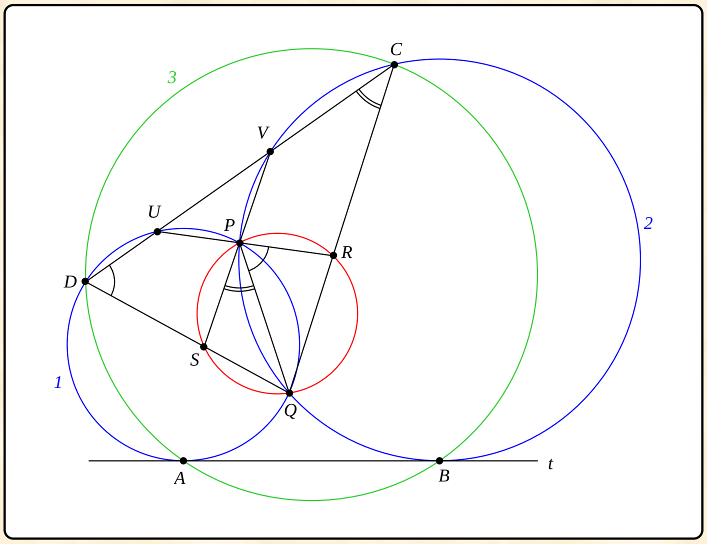


Given:	*1*,*2*	two intersecting circles,
	P, Q	intersection points of *1* and *2*,
	t	common external tangent to *1* and *2*,
	A, B	intersection points of t with *1* and *2* respectively,
	3	a circle passing through A and B,
	C, D	the second intersection points of *1* and *2*,
	U	the second intersection point of CD and *1*,
	V	the second intersection point of CD and *2*,
	R	the intersection point of (UP) and (CQ),
	S	the intersection point of (VP) and (DQ)

Prove: P, S, Q and R are concyclic.

*Jean-Louis Ayme 1/10/2016

VISUALIZATION



Proof.

- since $QCVP$ is cyclic we have: $\angle QCV = \angle SPQ$ (1)
- since $DQPU$ is cyclic we have: $\angle UDQ = \angle QPR$ (2)
- using (1) and (2) we get: $\angle SPR + \angle SQR =$
  $\angle SPQ + \angle QPR + \angle SQR =$
  $\angle QCV + \angle UDQ + \angle DQC = 180°$,
- $\therefore$ P, S, Q and R are concyclic.

$\square$