



Math for the people, by the people.

concyclic

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In any geometry where a circle is defined, a collection of points are said to be *concyclic* if there is a circle that is incident with all the points.

Remarks. Suppose all points being considered below lie in a Euclidean plane.

- Any two points P, Q are concyclic. In fact, there are infinitely many circles that are incident to both P and Q . If $P \neq Q$, then the pencil \mathfrak{P} of circles incident with P and Q share the property that their centers are collinear. It is easy to see that any point on the perpendicular bisector of \overline{PQ} serves as the center of a unique circle in \mathfrak{P} .
- Any three non-collinear points P, Q, R are concyclic to a unique circle c . From the three points, take any two perpendicular bisectors, say of \overline{PQ} and \overline{PR} . Then their intersection O is the center of c , whose radius is $|OP|$.
- Four distinct points A, B, C, D are concyclic iff $\angle CAD = \angle CBD$.