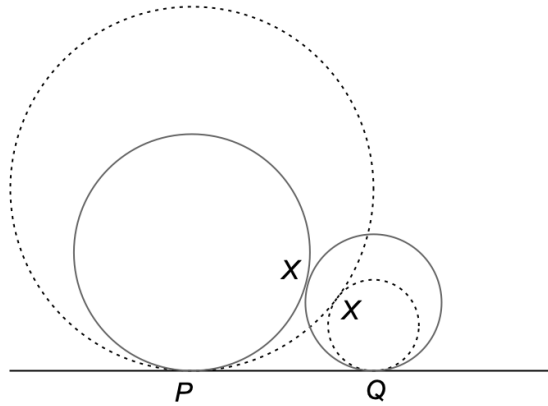


**Problem 13.** Let  $\ell$  be a line in the plane and let  $P$  and  $Q$  be distinct points on  $\ell$ . Circles  $C_1$  and  $C_2$  are tangent to  $\ell$  at  $P$  and  $Q$  respectively, and tangent to each other at the point  $X$ . The set of all possible points  $X$  that arise in this way is a curve consisting of several points. Describe this curve. Two examples of possible points  $X$  are shown in the figure below.



Solutions due by 12:00 noon, Monday, April 13. Solutions may be mailed to Elgin Johnston at ehjohnst@iastate.edu