

STILL MORE EXERCISES RELATED TO history11.pdf

As in the earlier exercises, “Burton” refers to the Seventh Edition of the course text by Burton (the page numbers for the Sixth Edition may be off slightly).

Additional exercises

Use coordinate geometry (as in the file `locus-problems.pdf`) to solve the following problems:

4. Find the locus (= set) of all points X such that the distance from X to a fixed line L is a fixed constant.
5. Let Γ be a circle with center Q and radius r . Find the locus (= set) of all points X such that X is the midpoint of a line segment joining Q to a point of Γ .
6. Let Γ be a circle with center Q and radius r , let $Y \neq Q$ be a point not on Γ , and suppose that $V \in \Gamma$ is a point such that the distance from V to Y is minimized. Prove that V lies on the line QY .
7. Let Γ be a circle with center Q and radius r , and let $a \leq \frac{1}{3}r$. If S the locus (= set) of all points X such that the (minimum) distance from X to Γ equals a , show that S consists of two circles which are concentric with Γ (*i.e.*, the point Q is the center of both circles in S). What are the radii of these two circles?

As is usually the case for geometrical problems, drawing a sketch at the start your work is highly recommended.