Mathematics 2260H – Euclidean Geometry
TRENT UNIVERSITY, Winter 2026

Assignment #10
The Lemoine Axis
Due on Friday, 27 March.[*]

Suppose that the vertices of $\triangle ABC$ are on a circle with centre O. Let P be the point where the tangent to the circle at A meets the extension of BC, Q be the point where the tangent to the circle at B meets the extension of AC, and R is the point where the tangent to the circle at C meets the extension of AB.

1. Draw a diagram of this setup. *[2]*

2. Show that P, Q, and R are collinear. *[8]*

HINT. Use similarity – for example, $\triangle BAQ \sim \triangle CBQ$ in this setup – and Menelaus' Theorem.

NOTE. The line that P, Q, and R are on is called the *Lemoine axis* of $\triangle ABC$.

Algebra Prayer

Our Professor, which doth have tenure,
Feared be thy name.
Thy sets partition,
Thy maps commute,
In groups as in vector spaces.
Give us this day our daily notation,
And forgive us our obtuseness,
As we forgive tutors who cannot help us.
Lead us not into Lye rings,
But deliver us from eigenvalues,
For thine is the logic, the notation,
and the accent,
That confuses us forever.
Amen.

By an anonymous University of Toronto math student.

[*] Please submit your solutions, preferably as a single pdf, via Blackboard's Assignments module. If that fails, please submit them to the instructor on paper or via email to `sbilaniuk@trentu.ca` as soon as you can.