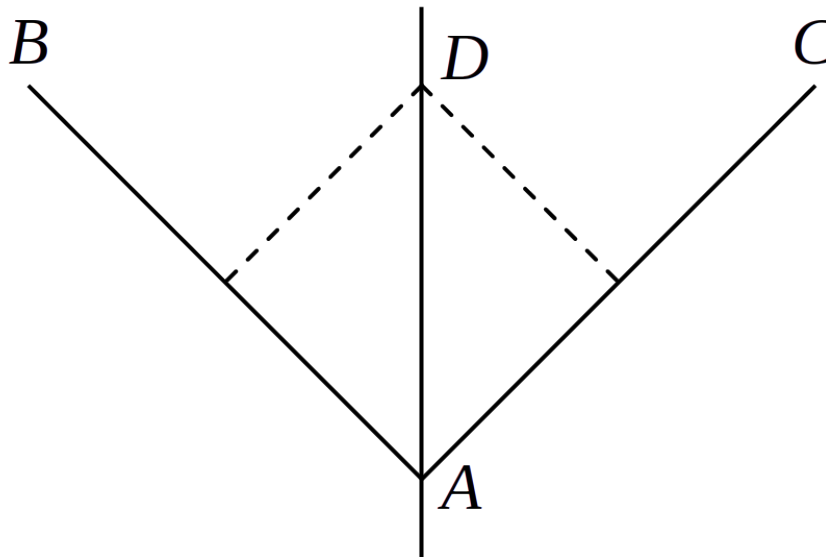**Mathematics 2260H – Geometry I: Euclidean geometry**
Trent University, Winter 2025
Assignment #8
Angle Bisectors, Triang;es, and Circles
Due on Friday, 14 March.*

1. Suppose AB and AC are line segments and D is any point. Show that $\angle BAD = \angle CAD$, *i.e.* D is on the angle bisector of $\angle BAC$, if and only if D is equidistant from the (extensions of) AB and AC. *[4]*

2. Given three infinite lines ℓ, m and n, that do not all meet at a single point, and such that no two are parallel, explain how to find the centres of and then draw all the circles that are tangent to all three lines. *[6]*

"Parallel lines meet at infinity!"
Euclid repeatedly, heatedly, urged.
Until he died, and so reached that vicinity:
in it he found that the damned things diverged.

      A grook by *Piet Hein*.