Mathematics 2260H – Geometry I: Euclidean Geometry
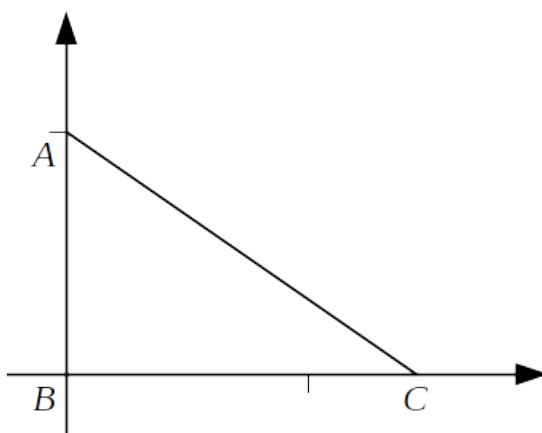Trent University, Winter 2025
Assignment #10
A Special Triangle
Due on Friday, 28 April.

Let $A = (0,1)$, $B = (0,0)$, and $C = (\sqrt{2},0)$ be the vertices of $\triangle ABC$ in the Cartesian plane.

1. Find the coordinates of G (the centroid), H (the orthocentre), I (the incentre), N (the centre of the nine-point circle), and O (the circumcentre), of $\triangle ABC$. *[5]*

2. Find the coordinates of the point at which the incircle and the nine-point circle of $\triangle ABC$ are tangent to each other. *[3]*

3. The Euler line of $\triangle ABC$ has special relationships with two of the triangle's medians. What are these relationships? *[2]*