Directions: Be sure to include in-line citations, including page numbers if appropriate, every time you use the results of discussion, a text, notes, or technology. **Only write on one side of each page.**

“*The intelligent man finds almost everything ridiculous, the sensible man hardly anything.*” – Johann von Goethe

1. In the figure below let \( g(\theta) \) denote the area of triangle \( \triangle PQR \) and \( f(\theta) \) denote the area of the curvilinear region with vertices \( P, Q, R \). Use trigonometric functions to write the area functions \( f(\theta) \) and \( g(\theta) \) and then use L'Hôpital’s Rule to compute

\[
\lim_{\theta \to 0^+} \frac{f(\theta)}{g(\theta)}.
\]