6. (20 points) The quantity \( \int_a^M \frac{dx}{\sqrt{(a^2 + x)(b^2 + x)(c^2 + x)}} \) roughly models the resistance that football-shaped plankton encounter when falling through water. Note that \( a = 1 \), \( b = 2 \), and \( c = 3 \) are constants that describe the dimensions of the plankton.

Find a value of \( M \) for which
\[
\int_a^M \frac{dx}{\sqrt{(a^2 + x)(b^2 + x)(c^2 + x)}}
\]
differs from the original model of resistance by at most 0.001. *Hint*: make use of the integral
\[
\int_a^M \frac{dx}{\sqrt{(a^2 + x)(b^2 + x)(c^2 + x)}}
\]
and the comparison test.