

Question #9662 Calculate $\lim_{x \rightarrow \infty} \frac{(\log x)^2}{\log \sin x}$.

Solution. Note that $\sin x < x$, $x > 0$. Hence $\frac{(\log x)^2}{\log \sin x} > \frac{(\log x)^2}{\log x}$ as $x > 1$, so

$$\lim_{x \rightarrow \infty} \frac{(\log x)^2}{\log \sin x} > \lim_{x \rightarrow \infty} \frac{(\log x)^2}{\log x} = \infty.$$

Answer. ∞ .