

Quiz
October 31, 2007

Solutions of all problems must be accompanied by relevant explanations.

Problem 1. Show that for any real number x we have $(\sinh(x))^2 = \frac{\cosh(2x) - 1}{2}$.

Problem 2. Find the limit $\lim_{x \rightarrow -\infty} \frac{(\tan^{-1}(x))^2 - \frac{\pi^2}{4}}{\tan^{-1}(x) + \frac{\pi}{2}}$.

Problem 3. Find the limit $\lim_{x \rightarrow 0} \frac{1 - \cos x}{x^2}$.