

Cal Poly Department of Mathematics

Puzzle of the Week

April 16-22, 2010

We all know that the series $\sum_{n=1}^{\infty} \sin n$ diverges (the terms fail to approach zero). However the *partial sums* $s_N = \sum_{n=1}^N \sin n$ remain bounded. What is the least upper bound for the set $\{s_1, s_2, s_3, \dots\}$?

Either an exact answer or a decimal approximation correct to 6 places will do. You may assume that $\{\sin(k) \mid k = 1, 2, 3, \dots\}$ is dense in $[-1, 1]$.

Solutions should be submitted to Morgan Sherman:

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before next Friday. Those with correct and complete solutions will have their names listed in next week's email announcement. Anybody is welcome to make a submission.