

Problem 4 (due Monday, March 31 )

A sequence  $a_1, a_2, \dots$  of real numbers has the following properties:

(i)  $|a_1 + a_2 + \dots + a_k| \leq 1$  for every  $k$ ;

(ii)  $|a_k - a_{k-1}| \leq 1/k$  for every  $k \geq 2$ .

Suppose that  $|a_k| \geq \frac{c}{\sqrt{k}}$  for infinitely many  $k$ .  
Prove that  $c \leq \sqrt{2}$ .

We received a solution from Josiah Moltz and Dr Mathew Wolak. For detailed solutions see the following link [Solution](#).

From:

<http://www2.math.binghamton.edu/> - **Department of Mathematics and Statistics,  
Binghamton University**

Permanent link:

<http://www2.math.binghamton.edu/p/pow/problem4s25>

Last update: **2025/04/03 17:51**

