



MATH PROBLEM OF THE WEEK

Fall 2024

Problem 9

Let S be a set of any 4 distinct real numbers. Can one always find two distinct numbers $a, b \in S$ such that

$$0 < \frac{a - b}{1 + ab} \leq 1?$$

If your answer is yes, then give a proof. If your answer is no, provide a counterexample.

We welcome solutions from everyone. The undergraduate participant from the NMSU main campus with the most correct solutions at the end of the semester will receive an award of \$500.

Solutions must be mathematically rigorous and originally obtained by the participants. Participants will be notified if their solutions are correct within a week.

Deadline: Monday, December 2, 10 am

This is the last problem of Fall 2024 and carries points equivalent to three problems. We will return in February 2025.

Send solutions to: mathpotw@nmsu.edu

More information at: <https://math.nmsu.edu/activities/math-problem-of-the-week.html>