MATH PROBLEM OF THE WEEK

Fall 2025

Problem 8

Let a, b, c, d be any four positive integers. Is the number

$$\Delta = abcd(a^4 - b^4)(a^4 - c^4)(a^4 - d^4)(b^4 - c^4)(b^4 - d^4)(c^4 - d^4)$$

always divisible by 13? Provide a proof if it is, or a counterexample if it is not.

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, November 17, 10 am
Next problem will be posted on November 17