

CALIFORNIA STATE UNIVERSITY, BAKERSFIELD

Lee Webb Math Field Day 2024

Team Medley, Freshman-Sophomore Level

Each correct answer is worth ten points. Answers require justification. Partial credit may be given. Unanswered questions are given zero points.

You have 50 minutes to complete the Exam. When the exam is over, give only one set of answers per team to the proctor. Multiple solutions to the same problem will invalidate each other.

Elegance of solutions may affect score and may be used to break ties.

All calculators, cell phones, music players, and other electronic devices should be put away in backpacks, purses, pockets, etc. Leaving early or otherwise disrupting other contestants may be cause for disqualification.

1. Six colors of paint are available. Each face of a cube is to be painted a different color. In how many ways can this be done, if two colorings are considered the same if one can be obtained by rotating the other?
2. How many integers solutions are there to the equation: $|x|+|y|\leq 100$?
3. Find all right triangles that have integer length sides and that have the property that the perimeter equals the area.
4. Determine which is greater: $\sqrt[99]{99!}$ or $\sqrt[100]{100!}$