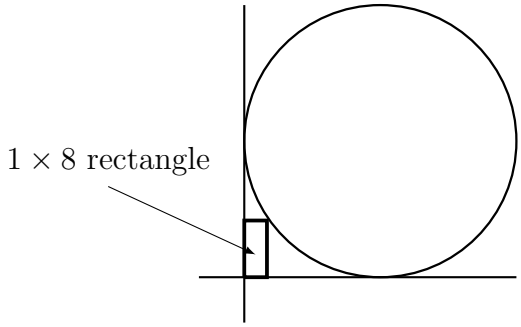
CALIFORNIA STATE UNIVERSITY, BAKERSFIELD
53rd Lee Webb Math Field Day 2026
Team Medley, Freshman-Sophomore Level

- 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. In the figure below, a circle is tangent to both a vertical line and a horizontal line. A rectangle with dimensions 1×8 is positioned with one vertex at the intersection of the lines and the opposite vertex touches the circumference of the circle. Determine the radius of the circle.



2. Let n be a positive integer, and let $f(n)$ represent the sum of the digits of n. Find all values of n that satisfy
$$n + f(n) + f(f(n)) = 2026.$$

3. Which 3 digit integers have squares that end with the same three digits (in the same order) as the original number?

4. In how many different ways can the letters of MATHEMATICS be arranged so that the arrangement does not start with a vowel and no two identical letters are next to each other?