NAU High School Day 2010
Qualifying question #1

**FOUR PIECES**
Divide the shape below along the lines into 4 congruent pieces, each of 5 squares. Pieces may be rotated or reflected.

![Diagram of a shape divided into 4 congruent pieces](image)

NAU High School Day 2010
Qualifying question #2

**TOGETHERNESS**
The average age of a group of students and teachers is 20. The average age of the teachers is 35, while the average age of the students is 15. By what ratio are the teachers outnumbered?

NAU High School Day 2010
Qualifying question #3

**ROUND 'N ROUND 'N ROUND**
Each of the three circles below has radius 6, and each is tangent to the others. What is the area of the white space between them?

![Diagram of three tangent circles](image)
CRY UNCLE

Jenni has three uncles, all from the Barhinkle family. Their names are Albert, Charles, and Nathan. They live in small towns called Appline, Currsen, and Nohau, in Arizona, California and Nevada. None of these towns is in a state with the same initial and no uncle's initial matches that of his state or town. If there is no Currsen in Arizona, where does Nathan Barhinkle live?

DOOR-STOPPER

AD is perpendicular to BC, AB is perpendicular to BD. BC is three times as long as AC, and triangle ABD has area 200. What is the area of triangle ABC?

LETTERS, NUMBERS

If H is 10, and T is half of M, how could MATH be 42, TEAM be 40 and MEET be 37?

NO MORE THAN ONE

Find all real values of x for which \( \frac{x - 3}{2x - 5} \leq 1 \).
**SUM PAIRS**

The four numbers $a < b < c < d$ can be paired in six different ways. If each pair has a different sum and the four smallest sums are 1, 2, 3, and 4, what are all of the possible values of $d$?

**GO FLY**

In the kite below, angles $A$ and $B$ have the same measure. What range of measures could $A$ have, while preserving the kite shape?

![Kite Diagram]

**IN ADDITION**

Consider the sum $1! + 2! + 3! + 4! + \ldots + 2010!$ What is the units digit of this sum?