Nassau County Interscholastic Mathematics League

Contest # 4

Answers must be exact or must have 4 (or more) significant digits, correctly rounded, unless otherwise noted

1998-99

Team Problems 35 minutes

T1. Complete the cross-number puzzle at right in which each across answer is a four-digit positive integer and each down answer is a three-digit positive integer. [Note: the grid at right is for scratch work only. Write your answer in the answer space as a 3 by 4 array of numbers (just as they appear in the grid)]

Across

1. Last two digits are equal

5. A Fibonacci number with a digit that appears twice

6. Digits all distinct multiples of the same prime digit

Down

1. A perfect cube

2. A Fibonacci number

3. Digits strictly increasing in a perfect square

4. A perfect cube

T2. Diagonal $\overline{BD}$ is drawn in quadrilateral ABCD. If $\angle A \cong \angle BDC$, AB = 30, AD = 18, DC = 25, and BD = 15, Find the length of $\overline{BC}$

T3. A baseball player has batted 140 times and now she has a batting average of .200. How many hits in a row must she get to raise her batting average over .300 ?

[Note: batting average = $\dfrac{number\ of\ hits}{number\ of\ at\ bats}$]

T4. The probability that Fred tells the truth is $\frac{2}{3}$. The probability that Joe tells the truth is $\frac{3}{4}$. Fred says it's raining. In the next room, Joe says it's raining. Find the probability that it is raining.

T5. **Solve for** x: $Arc\sin\sqrt{\dfrac{3x-1}{25}} + Arc\sin\sqrt{\dfrac{3x+1}{25}} = \dfrac{\pi}{2}$

T6. Find the length of the graph of $|x+y-1|+|x|-x|+|x-1|+x-1|=0$