Bergen County Mathematics League

Good Luck To You   BCML   Good Luck To All

Contest #3 (No Calculators)   **2009-2010**

Part I *Time Limit: 12 minutes*   On contests #4 and #6, *any S.A.T. calculator will be allowed.*

3-1. What is the smallest positive prime p for which p^2-p-1 is a composite number?

3-2. How many minutes apart are the first two times after 4 o'clock that the hands of a standard 12-hour clock are perpendicular to each other?

Part II *Time Limit: 12 minutes*

3-3. What are all real values of x which satisfy $|3x| + |x+1| = 2$?

3-4. What is the area of a circle in which a chord of length 6 is twice as far from the center as a chord of length 12?

Part III *Time Limit: 12 minutes*

3-5. If $x + y = 5$ and $xy = 3$, what is the value of $x^2 + y^2$?

3-6. What real value of x satisfies $4^{x+2} - 4^x = 30$?

Notice: A question on the next meet will repeat the theme of question 3-5.

Answers

3-1.   13

3-2. $32\frac{8}{11}$

3-3. $-\frac{1}{2}, \frac{1}{4}$

3-4. 45π

3-5.   19

3-6. $\frac{1}{2}$