1. How many real solutions are there to $x^2 = 2^x$? ________3__________

2. What is the largest difference between three-digit positive integers (those between 100 and 999, inclusive) that are reversals of each other ($abc - cba$) ? _______792_____

3. What is the minimum value of $\sec(\theta) \cdot \csc(\theta)$ on the interval $(0, \pi/2)$? ____2_____

4. What is the area of an n-sided regular polygon with perimeter p that is circumscribed about a circle of radius r?

   ____$pr/2$_____

5. Put the following three numbers in increasing order (you can use the letters a, b, and c):
   a. 100^{2012} b. $1006! \cdot 1006!$ c. $2012!$ _____abc_____

6. The complex number i is one root (zero) of the polynomial $2x^4 + x^3 - 4x^2 + x - 6$. Find all other roots.

   ____ $-i$, -2, 3/2___

7. Two fair, six-sided dice are tossed. What is the probability that the sum (of the spots showing) is a prime number? [Note: we meant the spots showing on top, the usual dice method.]

   ______5/12________

8. Put these mathematicians in order according to where they were born, starting at the International Date Line, which is just west of Hawai'i, and moving east. (Use the letters for your answer.)

   a. Srinivasa Ramanujan b. John Nash c. Emmy Noether d. William Rowan Hamilton

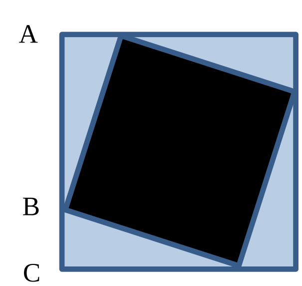
   _____bdca_____

9. How many times from noon until midnight are the continuously moving hour and minute hands of an analog clock at an angle of 180 degrees?

   _______11______

10. A square of area 1 is inscribed in a larger square (as shown) so that the length of AB is three times the length of BC. What is the area of the larger square?

    ____8/5______



Thank you for participating.