Contest Number 1

Name ____________________________  Math Teacher  ____________________________  Grade Level  ____  Score  ____

October 14, 2014

Time Limit: 30 minutes

NEXT CONTEST: NOV. 11, 2014

1-1. The lengths of the sides of a rectangle are the positive numbers $x$, $x^2$, $x^3$, and $x^4$. What is the area of this rectangle?

1-2. What is the larger of the only two primes $n$ for which $\frac{2326045}{n}$ has a prime value?

1-3. What is the only value of $n$ that satisfies

$$2014^n + 2013 \times 2014^{2012} + 2013 \times 2014^{2013} = 2014^{2014}?$$

1-4. What is the sum of the degree-measures of the angles at the outer points $A$, $B$, $C$, $D$, and $E$ of a five-pointed star, as shown?

1-5. What is the ordered pair of positive integers $(k, h)$, with the least value of $k$, which satisfies $\sqrt{2} \cdot \sqrt{3} \cdot \sqrt{4} = \sqrt{h}?$

1-6. A face-down stack of 8 playing cards consisted of 4 Aces ($A'$s) and 4 Kings ($K'$s). After I revealed and then removed the top card, I moved the new top card to the bottom of the stack without revealing the card. I repeated this procedure until the stack was left with only 1 card, which I then revealed. The cards revealed were AKAKAKAK, in that order. If my original stack of 8 cards had simply been revealed one card at a time, from top to bottom (without ever moving cards to the bottom of the stack), in what order would they have been revealed?