2006-2007 BHS Math Club Warm-Up 4

Name _____ Grade _____

1. You have a pile of 1 MILLION cookies. If you eat 10 cookies a day, how many days will it take you to eat all of the cookies?

2. The lines $y = 2x - 7$ and $y = -x + 20$ intersect at a tragic point that will go down in history. What is it?

3. If you were a conehead and wanted to buy a cone hat with base radius 4 and volume 48π, how tall would your hat have to be?

4. Evaluate and simplify: $\dfrac{3}{2 + \frac{7}{1+\frac{5}{6}}} \cdot \dfrac{5 + \frac{7}{5}}{3}$.

5. If it takes me 5 hours to build a clay nation by myself and $\dfrac{35}{12}$ hours for me to build one with a friend, how long would it take my friend to build a clay nation by himself?

6. Solve for all x satisfying $x^4 - 5x^2 + 4 < 0$.

7. How many permutations of the word KOALA have the L before both of the A's?

8. Write in one, BIG logarithm: $\log_a b^5 - \log_a bc + \log_{a^3} c^3$.

9. What is the sum of all two-digit positive integers that satisfy the property that the product of its digits is 18?

10. Find the product of the greatest common factor and the least common multiple of 420 and 165.

11. Two sides of a triangle are 4 and $|\cos\theta|$ and the angle between them is θ. If $0 < \theta < \pi$, what is the maximum area of the triangle?

12. If Pokémon only come in groups of 6 and 7, what is the largest integer number of Pokémon that I cannot catch?

13. Let P be a polynomial of degree 4. Evaluate $P(6)$ if $P(k) = k^2$ for $k = 1, 2, \ldots, 4$ and $P(5) = 145$.

14. Given that z is a complex number on the unit circle in the complex plane, find a nonreal z that minimizes $z^{2006} + \overline{z}^{2006}$.

15. Evaluate $\lim_{n\to\infty} F_{(n,n)}$, where $F_{(m,1)} = m$ and $F_{(m,k+1)} = (m-k)^2 + \dfrac{1}{2}F_{(m,k)}$ for $k, m, n \in \mathbb{N}$.