1. (Homage to Jerry Wu) Does headbanging facilitate mental math? Find 28 times 72 while banging your head, and find 97 times 34 without. Then find their sum. (Disclaimer: MMT is not responsible for any injuries as a result of headbanging. Also, you don't actually have to headbang if you don't want to.)

2. Submit any integer between 0 and 2,147,483,647, inclusive. What is the sixth largest answer submitted? Grading for this problem will be 15/12/10/8/6/4/3/2/1 for sixth largest, fifth/seventh largest, fourth/eighth largest, etc.

3. Compute $2 + 4 + 6 + 8 + 10 + \cdots + 62$.

4. Pick any one of the following numbers to submit: $0, 1, 2, e^{\pi}, 42, 73, 1337$. (If you choose any other number, you will get a score of zero.) What is the number least often submitted for this problem? Grading for this problem will be 15/11/8/5/3/1/0 for least common, second least common, etc. If any two numbers have the same frequency of submissions, they will be graded on their values' averages. (e.g. if 0, 1 both have only 1 submission, they will be worth 12.5 points each)

5. Compute $7.01^3 - 3 \cdot 7.01^2 \cdot 0.01 + 4 \cdot 7.01 \cdot 0.01^2 - 0.01^3$.

6. You are entered in a betting contest with everyone else. You can bet any non-negative integer number of points up to 20. If you bet the highest (or tied for the highest), you lose everything, but if you bet $n$th highest you get back $k(1 + \frac{1}{n})$ points, where $k$ is your initial bet, rounded down to the nearest integer. If there are ties, then $n$ for each person in the tie will be the average of all $n$'s the people involved would have gotten if they were not tied.

7. Find the sum of the factors of 9991.

8. Congratulations, you just won ten points! Now, write down anywhere from 1 to 5 primes less than 200. If for some reason you don't do this (or one of your numbers isn't a prime), you will lose the 10 free points you just earned. Now, for each prime, if no one else writes that number, you gain one point, but if anyone else writes it, you lose one point. Choose wisely.

9. Determine the number of zeroes at the end of the base-9 representation of 1000!.

10. What will be the geometric mean of the absolute value of the scores of this examination (excluding this question)? Grading for this problem will be 15/12/10/8/6/4/3/2/1 for closest, second closest, etc. by ratio.

11. If we place a knight on every square of a 2 by 11 chessboard, then how many ways are there to rearrange the knights such that each knight either stays in place or makes one move? (A knight is a piece that can move two squares horizontally and one square vertically, or two squares vertically and one square horizontally.)

12. When you see this question, raise both your hands (try to do this without anyone else noticing). A proctor will come over to verify. The $n$th person to do this will get $17 - 2n$ points, if $n \leq 8$. Otherwise, you get 0 points.

13. Trapezoid $ABCD$ has right angles at $A$ and $D$, and diagonals $AC$ and $BD$ intersect at $E$. The area of triangle $ABE$ is $25\text{in}^2$ and the area of triangle $DEC$ is $81\text{in}^2$, and $AD = 7$. What is the area of trapezoid $ABCD$?

14. Compute the $(40-3n)$th prime, where $n$ is your rank for the twelfth problem. If you scored zero points on problem twelve, compute the fifteenth prime.

15. Define $f(n) = n+(\text{largest prime factor of n})^2$. Find the sum of all values of $n$ such that $f(f(n)) = 2015$.