Directions: You have 15 minutes to complete these 8 problems. All answers must be written in accordance with the conventions on the Conventions page on the MSJHSSBMTTPSTMT website. Write all of your answers on the answer sheet **with a pen**. You may not change your answers once you have written them down. Crossed-out answers, scratch work, or other stray marks will be penalized. No calculators or scratch paper allowed.

Please write your name here:

1. Compute $1 + 2 + 3 + \cdots + 24 + 25$.
2. Compute the units digit of $2^9 + 4^9 + 6^9 + 8^9$.
3. Let $ABCDE$ be a pentagon, and let $\angle A = 43^\circ, \angle B = 123^\circ, \angle C = 110^\circ$, and $\angle D = 92^\circ$. What is the exterior angle at E?
4. Compute 1499×1501.
5. Compute
$$\binom{13}{1} + \binom{13}{3} + \binom{13}{5} + \cdots + \binom{13}{13}$$
.
6. There once was a glowing blue supernatural right triangle floating up in the sky at 3:14 in the morning. On one of the legs was inscribed, in an alien derivative of runes, the second-degree polynomial expression $x^2 - 8x + 33$. A bewildered observer of the triangle was abducted by several aliens and told him two facts:

   (a) that the hypotenuse of the blue triangle was two times the largest possible value of b in the equation $ab - 7a - 4b - 6 = 0$ given that a, b in solutions (a, b) must be integers;

   (b) that the other leg was the number of possibilities when one creates a word consisting of 3 runes, where there are 2 possible runes, and engraves this word onto 2 rocks of 5. (Words are not otherwise restricted.)

   He was told that to be set free, he had to find the largest value of x that does not generate a contradiction in the 11-dimensional realm of glowing blue supernatural right triangles. Can you help this poor human answer the riddle and escape the wrath of the aliens?
7. Compute the number of ways to tile a 2×6 grid with 1×2 tiles and L-triminos. (Such a tiling does not have to use both 1×2 tiles and L-triminos.)
8. Compute the sum of the factors of $1,215,000$.