Problem I.3: Partial Sum

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The partial sum I created was,

$$m_n = \sum_{i=1}^{n} \frac{i^8 + i^6 + i^4 + i^2}{8^i}.$$

The series s_n will diverge because the terms of the partial sum continue to increase no matter how large the total number of terms is. I tested up to 10,000 terms and the terms continued to increase. I kept increasing the number of terms to determine if the series kept increasing and it did.

The series t_n will converge because within the first 15 terms it reaches 1.01106503 by the 6th term and it is repeated for the rest of the terms listed. I tested this with 100 terms.

The series m_n will converge because testing with 100 terms, the last 15 terms are the same 60.57506027.

I used 100 for the series t_n and m_n because it was plenty of terms to ensure that there was no error in seeing where the series converge.