Partial Sum Assignment

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1 Partial Sum Terms

First Term (Eq1)

$$\sum_{i=1} \frac{\ln(i^4 + i + 3)}{\sqrt{i} + 3}$$

Second Term (Eq2)

$$\sum_{i=1} \frac{e^{\frac{i}{100}}}{i(10)}$$

Note: I could not figure out how to raise the 10 to the ith power.

Third Term (Eq3)

$$\sum_{i=1} \frac{e^2}{i^3}$$

The first 15 partial sum terms I created are [0. 7.3890561 8.31268811 8.58635686 8.70181086 8.76092331 8.7951319 8.81667434 8.83110609 8.84124197 8.84863102 8.85418253 8.8584586 8.86182185 8.86451466]

The last 15 partial sum terms I created are [8.88156052 8.88157214 8.88158336 8.8815942 8.88160468 8.88161482 8.88162462 8.88163411 8.8816433 8.88165219 8.88166081 8.88166916 8.88167726 8.88168511 8.88169273]

2   Divergence and Convergence

Based on the output from the first partial sums equation, I think this series will diverge. The series started with 0, continues to increase until the last value was around 147. The second partial sums converges. It increased by decimals each time until the seventh term. After the seventh term the series converges at 1.01106503 and remained there throughout the series. The third partial sum also diverged because there is an increase throughout the whole series, however, the increase is not drastic.

3   Conclusion

I decided to choose 100 terms. When looking at my data and how close the output variables are for the third equation, I probably should have chosen a larger number. It appears to diverge, however, it could potentially converge within 100 more terms.