I.4 Partial Products

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1 Conclusions

- $s_n = \Pi_{i=2}^{n} \frac{i^3-1}{i^3+1}$

I created 15 partial product terms for this sequence, they are as follows:
0.7777777777777778
0.9285714285714286
0.9692307692307692
0.9841269841269841
0.9907834101382489
0.9941860465116279
0.9961013645224172
0.9972602739726028
0.998001998001998
0.9984984984984985
0.9988432620011567
0.9990900818926297
0.9992714025500911
0.9994075829383886

I am estimating that this sequence will converge at 1. I came to this conclusion because each of the terms are gradually increasing towards 1, and by experimenting with variable manipulation within the program. My estimation of the value was incorrect, after experimenting with higher values in the hundreds of thousands I am concluding that the series converges at .6666666667.

- $t_n = \Pi_{i=1}^n \frac{e^{i/100}}{i^{10}}$

For this summation I created 15 partial sum terms, they are as follows:
1.010050167084168
0.0009962903711198787
1.7450838015097918e-05
9.925945035861857e-07
1.0765016026890488e-07
1.7560835111275428e-08
3.7968217925324015e-09
1.0088897009146946e-09
3.138061198711926e-10
1.1051709180756477e-10
4.303735192027638e-11
1.8209703622079293e-11
8.260850442002587e-12
3.976820656790045e-12
2.0147983277511253e-12

Based on these values becoming increasing smaller and smaller I estimate that this series would converge around a value greater than 1 and less than 3, based on the pattern of outputted terms. This was incorrect as I did not take note that each term This experimentation led me to further believe that the equation would converge, but upon further testing and plugging in values I was able to conclude that the series converges at 0.

- $U_n = \Pi_{i=1}^{n} \frac{i^2 \pi}{6}$

I created 15 partial sum terms for this summation, they are as follows:
2.0
1.25
1.1111111111111112
1.0625
1.04
1.0277777777777777
1.0204081632653061
1.015625
1.0123456790123457
1.01
1.0082644628099173
1.0069444444444444
1.0059171597633136
1.0051020408163265
1.0044444444444445
1.00390625

Before I saw the results I was attempting to create a sequence that would converge. This sequence will converge at a value of **3.76.**