

"The more I read, the more I acquire, the more certain I am that I know nothing."

VOLTAIRE

In class work 17 has questions 1 through 1 with a total of 3 points. Turn in your work at the end of class on paper. This assignment is due Tuesday 9 April 13:20.

1. Define a sequence s by $s_n = \sum_{k=0}^n \frac{(-1)^k}{(k+1)^{3/2}}$. This is a convergent alternating series. Also define $s_\infty = \lim_{n \rightarrow \infty} s_n$.
- (a) Use Desmos to graph s on the interval $[1, 2, \dots, 300]$. Also use Desmos to find the numeric values of s_{299} and s_{300} . As best you can, reproduce a cartoon of the graph of s .

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- (b) From the theory of convergent alternating series, we know that $s_{299} < s_{\infty} < s_{300}$. From this, we can conclude that

$$s_{\infty} = \left(\frac{s_{300} + s_{299}}{2} \right) \pm \left(\frac{s_{300} - s_{299}}{2} \right)$$

Here we are using the \pm symbol to mean some number in a interval; specifically for $a \in \mathbf{R}$ and $b \in \mathbf{R}_{>0}$, by $a \pm b$ we mean some number in the closed interval $[a - b, a + b]$. Express s_{∞} in the form of $a \pm b$.