Critical Thinking Questions.

1. Let's example the function in $y = \dfrac{x^3}{3x^3 + x + 1}$

2. This is symbol for all real number $\mathbb{R}$.

3. This is symbol for all rational number $\mathbb{Q}$.

4. This is symbol for all integer number $\mathbb{Z}$.

5. Is it possible for a sequence to converge to two different numbers? If so, give an example. If not, why not?

6. Explain hoinw to use partial sums to determine if a series converges or diverges. Give an example

7. Explain why $\int_1^\infty f(x)\,dx$ and $\sum_{n=1}^{\infty} a_n$ need not converge to the same value, even if they are both convergent.

8. In your own words Explain the alternating series remainder theorem. How is this theorem useful?

9. Explain the difference between absolute and conditional convergence. Give an example of each?

10. The Ratio test is inconclusive $\lim_{n\to\infty} \left|\dfrac{a_{n+1}}{a_n}\right| = 1$. Give an example of one convergence series and one divergent series $\lim_{n\to\infty} \left|\dfrac{a_{n+1}}{a_n}\right| = 1$. Explain how you determined your examples.