

Do Now

1. Write a third degree Maclaurin polynomial for $f(x) = \frac{1}{\sqrt{1+x}}$.

2. *An Alternating Series*

Read both parts of this question before you do anything. Plan your exploration. You will need a calculator a graph white board, and two different color pens.

- (a) Explore the subsequence $\left\{ \frac{(-1)^{k+1}}{k} \right\}_{k=1}^{10}$. Use your calculator to get values you can plot on a graph-paper white board. Use one pen for all 10 points.
- (b) Explore the series $\sum_{k=1}^n \frac{(-1)^{k+1}}{k}$ for n taking on the integers values of 1 to 10. Use your calculator to get values you can plot on a graph-paper white board. Use the other color pen for these 10 points.
- (c) Will either sequence converge?

More Questions

3. Determine whether each series converges or not. Explain. For any series which does converge, find the sum.

(a) $\sum_{n=2}^{\infty} \frac{1}{3^n}$

(b) $\sum_{n=0}^{\infty} \frac{3^n}{8^{2n+1}}$

(c) $\sum_{n=5}^{\infty} \frac{10^n}{11^n}$

(d) $\sum_{n=1}^{\infty} \frac{3^n}{3^{n+4}}$

4. (a) Does the series $\sum_{k=1}^{\infty} \frac{1}{k}$ converge? Explain two different ways to explain why your answer is correct.
- (b) Does the series $\sum_{k=1}^{\infty} \frac{(-1)^{k+1}}{k}$ converge? Explain why your answer is correct.

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