Partial Sums

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The partial sums terms that I created are:

$$s_n = \sum_{i=1}^{n} \frac{\sin(i)}{i^2 \cos(i)}$$

Convergence or divergence of the series:

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

   The terms of the partial sum sequence for this series continue to increase pretty quickly as n increases, so it seems like the terms increase without bound. Because of this, I would conclude that the series will diverge.

2. $$t_n = \sum_{i=1}^{n} \frac{e^{i/100}}{i^{10}}$$

   I think that this series will diverge, because as I increased n, the last 15 terms of the sequence continued to increase as if they were approaching infinity. Also, the limit of the function $\frac{e^{i/100}}{i^{10}}$ as i approaches infinity is infinity, so it makes sense that the terms of the sequence seem to increase without bound. Since a series can't converge to infinity, this brings me to the conclusion that the series will diverge.

3. $$s_n = \sum_{i=1}^{n} \frac{\sin(i)}{i^2 \cos(i)}$$

   I think that this series will converge, because as n increases, the terms of the partial sum sequence remain at approximately 1.709; as an example, when $n = 2000$, the last 15 terms are ≈ 1.709, and when $n = 50000$, the last 15 terms are again ≈ 1.709. Therefore, it seems that this series will converge to approximately 1.709.