

In **30 minutes** do the following problems, **without help** from any references, computing devices, or people. Write your solutions on either a printout or blank paper. If you use blank paper, do the problems on **1 sheet of paper, in the order given**. Upload a pdf of your solutions to **Gradescope, by midnight**.

Show your work.

1. Consider the series $\sum_{n=1}^{\infty} \left(\frac{1}{\sqrt{n+1}} - \frac{1}{\sqrt{n+2}} \right)$.

(a) Compute a simple expression for the n th partial sum, s_n .

(b) Determine the number s to which this series converges.

2. State whether each series converges or diverges, and **how you know**. If it converges, give its limit.

(a) $\sum_{i=1}^{\infty} \frac{3(2^i)}{7^{i+2}}$

(b) $\sum_{k=1}^{\infty} \frac{(2\pi)^k}{1000}$