

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. Does the series $\sum_{n=0}^{\infty} \frac{(n+1)8^n}{n!}$ converge or diverge? Show work to justify your answer.

2. A function is defined by a power series as $f(x) = \sum_{n=0}^{\infty} \frac{(-1)^n}{(n+1)3^n} x^n$.

(a) Determine its radius of convergence, showing your work.

(b) Determine its interval of convergence, showing your work. (Don't forget to check the endpoints.)