MAT137 - Calculus with proofs

- Assignment 9 due on March 25
- Assignment 10 due on April 8
- Test 5 opens on April 22

- Today: Power series
- Friday: Taylor polynomials **(Videos 14.3, 14.4)**
- Monday: Taylor series (Videos 14.5, 14.6)
- Wednesday: Analytic functions (Videos 14.7, 14.8)

Find the interval of convergence of each power series:

1. $\displaystyle\sum_{n=0}^{\infty} \frac{x^n}{n!}$

3. $\displaystyle\sum_{n=1}^{\infty} \frac{n^n}{42^n} x^n$

2. $\displaystyle\sum_{n=1}^{\infty} \frac{(x-5)^n}{n^2\, 2^{2n+1}}$

4. (Hard!) $\displaystyle\sum_{n=0}^{\infty} \frac{(3n)!}{n!(2n)!}\, x^n$

You know that $\dfrac{1}{1-x} = \displaystyle\sum_{n=0}^{\infty} x^n$ for $|x| < 1$

Manipulate it to write the following functions as power series centered at 0:

1. $g(x) = \dfrac{1}{1+x}$

2. $A(x) = \dfrac{1}{2-x}$

   Hint: Factor $1/2$.

3. $h(x) = \dfrac{1}{1-x^2}$

4. $F(x) = \ln(1+x)$

   Hint: Compute F'