

MATH 555 — FALL 2016 — HOMEWORK ASSIGNMENT 8 — DUE THURSDAY,
NOVEMBER 10

- (1) (Thursday?) Page 150, Problem 8. In addition, find the radius of convergence of your series *two different ways*.
- (2) (Friday?) Consider the real Taylor series for the infinitely-differentiable function $f : \mathbb{R} \rightarrow \mathbb{R}$ given by

$$f(x) = \tanh(x) = \frac{e^x - e^{-x}}{e^x + e^{-x}}.$$

about $x = 0$. Please make a plot of this function along with a few partial sums of its Taylor series (of high enough order to see what is happening). For which $x \in \mathbb{R}$ does its Taylor series about $x = 0$ converge? Explain.

- (3) (Saturday?) Page 152, Problem 15. Note the typo: in the first part of the question you should show that under the given conditions

$$f(a) - f(b) = \frac{a - b}{2\pi i} \oint_C \frac{f(z) dz}{(z - a)(z - b)}$$

where C is the *positively-oriented* circle $|z| = R$.

- (4) (Sunday?) Page 152, Problem 16.
- (5) (Monday?) Page 152, Problem 17 (b), (c). (There is an answer in the back so please supply reasons for this answer.)
- (6) (Tuesday?) Page 152, Problem 22.
- (7) (Wednesday?) Page 153, Problem 27.