

Math 4513, Homework 2, Due on 9/28/2012

1. (10 points) The following sequence

$$p_0 = 0.75, \quad p_n = \left(\frac{e^{p_{n-1}}}{3} \right)^{0.5} \quad \text{for } n = 1, 2, 3, \dots$$

is linearly convergent.

- Which number does p_n converge to? Write down your estimation with at least 3 significant digits.
 - Compute the first 5 terms of $\{\hat{p}_n\}$ using the Aitken's acceleration.
 - Compare $\{p_n\}$ and $\{\hat{p}_n\}$. Do they converge to the same number? Which one converges faster?
2. (10 points) Use Horner's method to compute $P(4)$ and $P'(4)$ where

$$P(x) = 3x^5 + x^4 - 2x^3 - 5x^2 + 12x - 5$$