Math 105 91A[1] March 6th, 19100 Worksheet 10

http://www.math.ubc.ca/~ athreya/105 Sections 17.5,8

1. Use the trapezoidal rule with $n = 4$ to estimate $\int_1^2 x^2 dx$ and compare this approximation with the exact value of the integral.

Ans: 2.34375 and exact answers is $\frac{7}{3}$

2. You are given the following information:

Time t	Velocity v(t)
0	20
1	19
2	15
3	13
4	6
5	1

(a)Provide a rough sketch of v as a function of t.
(b) Using rectangles of equal width find an estimate which is larger than the distance traveled in 5 minutes.
(c) Using the trapezoidal rule with a suitable n find an estimate the distance traveled in 5 minutes.
(d) Using rectangles of equal width find an estimate which is smaller than the distance traveled in 5 minutes.

3. Investigate the convergence of the $\int_1^\infty x^p dx$ for all values of p

Ans: Converges for $p < -1$.

Typo in Answer to 3 of W9: Should be
$\frac{x^2}{2}\ln(x) - \frac{x^2}{4} + C$, $\frac{x^3 e^{-0.08x}}{-0.08} - \frac{3x^2 e^{-0.08x}}{(0.08)^2} - \frac{6e^{-0.08x}(0.08x-1)}{(0.08)^4} + C$

[1] **Office hours:** Monday:1:30-2:30pm, 3-4pm, Tuesday:11:30-12:30 am, 3:30-4:30 pm, Wednesday: 10:30-11:30 am