Math 120 Assignment 4 Solutions

1(a) $\int_1^4 (x^2 - x)\,dx$ (b) $\int_0^{\pi} \sin x\,dx$

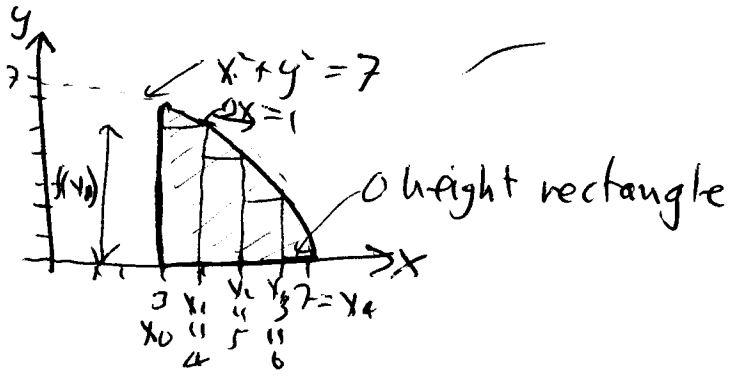
2(a) $\lim_{\Delta x \to 0} \sum_{i=1}^{n} \sqrt{49 - x_i^2}\,\Delta x$, $\Delta x = \frac{7-3}{n} = \frac{4}{n}$, $x_i = 3 + i\Delta x$

or $\lim_{n \to \infty} \sum_{i=1}^{n} \sqrt{49 - x_i^2}\,\Delta x$

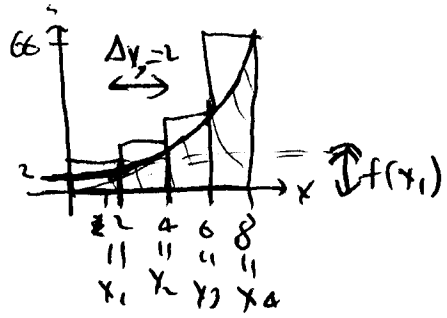
(b) $\lim_{\Delta x \to 0} \sum_{i=1}^{n} (2 + x_i^2)\Delta x$ $\Delta x = \frac{8-0}{n} = \frac{8}{n}$, $x_i = 0 + i\Delta x = i\Delta x$

or $\lim_{n \to \infty} (\ldots)$ again.

3 (a) "(a)"



"(b)"



4(a) $n = 4$ $\Delta t = \frac{4-1}{3} = \frac{3}{4}$ $S_4 = \sum_{i=1}^{4} (t_i + t_i^2)\Delta t$ $t_i = 1 + i\Delta t$
$= 1\frac{3}{4}, 2\frac{1}{2}, 3\frac{1}{4}, 4$

Or $S_4 = (t_1 + t_1^2)\frac{3}{4} + (t_2 + t_2^2)\cdot\frac{3}{4} + (t_3 + t_3^2)\frac{3}{4} + (t_4 + t_4^2)\frac{3}{4}$

$n = 20$, $\Delta t = \frac{4-1}{20} = \frac{3}{20}$, $t_i = 1 + i\Delta t$, $S_{20} = \sum_{i=1}^{20} (t_i + t_i^2)\cdot\Delta t$

$n = 100$ $\Delta t = \frac{4-1}{100} = \frac{3}{100}$ $t_i = 1 + i\Delta t$ again, $S_{100} = \sum_{i=1}^{100} (t_i + t_i^2)\Delta t$