Math 131: Pre-Lab 2. Complete and Bring to Lab. Name: Answers

1. a) Fill in the following table for the Riemann sum using regular partitions and right-hand endpoints.

$f(x)$	$[a,b]$	Δx	$x_i = a + i\Delta x$	$f(x_i)$	Wirte out Right$(n) = \sum_{i=1}^{n} f(x_i)\Delta x$ (Do not simplify yet)
$(x+1)^2$	$[0,3]$	$\frac{3}{n}$	$0 + \frac{3i}{n} = \frac{3i}{n}$	$\left(1+\frac{3i}{n}\right)^2$	$\sum_{i=1}^{n} \left(1+\frac{3i}{n}\right)^2 \frac{3}{n}$

b) Simplify Right$(n) = \sum_{i=1}^{n} f(x_i)\Delta x$. No sum should appear. (Use back, if needed.)

$$\text{Right}(n) = \sum_{i=1}^{n}\left(1 + \frac{6i}{n} + \frac{9i^2}{n^2}\right)\frac{3}{n} = \frac{3}{n}\sum_{i=1}^{n} 1 + \frac{18}{n^2}\sum_{i=1}^{n} i + \frac{27}{n^3}\sum_{i=1}^{n} i^2 = \frac{3}{n}(n) + \frac{18}{n^2}\frac{n(n+1)}{2} + \frac{27}{n^3}\frac{n(n+1)(2n+1)}{6}$$

$$= 3 + 9\left(\frac{n+1}{n}\right) + \frac{9}{2}\left(\frac{2n^2+3n+1}{n^2}\right) = 3 + 9 + \frac{9}{n} + \frac{9}{2}\left(2 + \frac{3}{n} + \frac{1}{n^2}\right)$$

c) Evaluate $\lim_{n\to\infty}$ Right(n). When $f(x)$ is continuous, this limit is denoted by $\int_a^b f(x)\,dx$. Here we would write $\int_0^3 (x+1)^2\,dx$.