WORKSHEET 1

1. Evaluate the following sums:

$$\sum_{n=1}^{6} k(3k+5), \qquad (\sum_{n=1}^{7} k)^2 - \sum_{n=2}^{7} \frac{k^3}{4}$$

2. For the given functions write down the Riemann sums for subdivision of the given interval into n subintervals and using right hand endpoint for each c_k. Then by sending $n \to \infty$ evaluate the integral of that function on the interval

$f(x) = 2x$ over $[0, 3]$, $f(x) = x^2 - x^3$ over $[-1, 0]$

3. Use known areas to evaluate these integrals:

$\int_{-2}^{4}(\frac{x}{2}+3)dx$, $\int_{-4}^{0}\sqrt{16-x^2}dx$, $\int_{-1}^{1}(1-|x|)dx$

4. Use trapezoidal and Simpson rules to estimate the given integrals with $n = 4$ steps and find an upper bound for error. Then evaluate the integral and find the actual error. Finally express the error as a percentage. (i.e. $(|error|/(truevalue))/ \times 100$)

$\int_{-1}^{1}(x^2+1)dx$, $\int_{0}^{2}(t^3+t)dt$