

Introduction to Matlab Programming and Functions Homework 2

1. Calculate the partial sums (cumulative) and the final sum for series (1) and series (2)

$$1) \sum_{n=1}^{n=10} n \quad a(n) = n$$

$$2) \sum_{n=1}^{n=10} n^2 \quad a(n) = n^2$$

and plot the partial sum $S(N)$ as a function of N and compare to the analytic results:

$$S_1(n) = \frac{n(n+1)}{2}; S_2(n) = \frac{n(n+1)(2n+1)}{6}$$

2. Generate a periodic signal used in engineering all the time, an alternating square wave of height 5 of period 2 for 5 periods. Mathematically:

- a. if $0 \leq t < 1$ $V=5$
- b. if $1 \leq t < 2$ $V=-5$
- c. if $2 \leq t < 3$ $V=5$
- d. if $3 \leq t < 4$ $V=-5$

3. Plot $z = xe^{-(x^2+y^2)}$ using the contour function. Label and estimate the global maxima and minima values.

4. The sumpos function listed below contains a bug, find the bug and fix it.

```
function s = sumpos(x)
% sumpos Add up the positive elements of a vector
% Synopsis: s = sumpos(x)
% Input: x = a row or column vector
% Output: s = sum of elements in x that are greater than
% zero

s =0;
for i=1:length(x)
    if x(i)>0
        s =s +x;
    end
end
end
```