Name:
Group B
Result:

1. [8 *points*]

Calculate the following sums:

a) $3 + 7 + 11 + ... + 87 =$

b) $\sum_{k=1}^{9} 3 \cdot 2^{k-1}$

c) $\sum_{k=1}^{10} \frac{k+1}{5}$

d) $\sum_{k=1}^{\infty} 12 \cdot \left(\frac{1}{3}\right)^{k}$

2. [2 *points*]

In an arithmetic sequence the third term is equal to 12 and the tenth term is equal to -23. Find the first term and the common difference.

3. [4 *points*]

$2a+1$, $3a-5$ and $a+1$ are the first three of an arithmetic sequence (in the given order).

(a) Find a.

(b) Find the sum of the first 20 terms of this sequence.

4. [4 *points*]

$3x+5$, $3x+1$ and $2x$ are the first three of an infinite geometric sequence (in the given order).

(a) Find the possible values of x.

(b) Find the sum to infinity of both sequences (if such sums exist).

5. [2 *points*]

Show that if a sequence u_n is geometric, then the sequence $v_n = \log(u_n)$ is arithmetic.

6. [3 *points*]

The sum of an arithmetic sequence is given by the formula $S_n = n^2 - 4n$. Find the number of terms of this sequence which are smaller than 100.

7. [2 *points*]

Consider an infinite geometric series:

$$3 + \frac{2x-1}{3} + \frac{(2x-1)^2}{27} + ...$$

(a) Find the set of possible values of x for which the series converges.

(b) Find the sum when $x = 1$.