Name:
Result:

1. *(3 points)*

The sixth term of a geometric sequence is -32 and the eleventh term is 1. Find the first term, the common ratio and the sum to infinity of this sequence.

2. *(4 points)*

The fifth, ninth and twelfth terms of an arithmetic sequence, with common difference 3, are the first three term of a geometric sequence.

(a) Find the ratio of the geometric sequence.

(b) Find the least value of n, for which:

$$S_n - S_\infty < 1$$

i.e. the difference between the first n terms of the geometric sequence and its sum to infinity is smaller than 1.

3. *(3 points)*

The common ratio of a geometric sequence is 5. The sum of the first $2n$ terms of this sequence is 626 times the sum of the first n terms. Find the value of n.

4. *(3 points)*

Sum to infinity of a geometric sequence is equal to 6. The first term of this sequence is equal to its ratio. Find the smallest possible value of k, for which the k-th term is smaller than $\frac{1}{20}$.

5. *(3 points)*

The sum to infinity of a geometric series is equal to the sum to infinity of the squares of its terms. If the first term of the geometric series is $\frac{1}{4}$, find its ratio.