Name: _____

Geometric Sequence and Series

1) Suppose we have the geometric sequence 24 + 12 + 6 + 3 + . . . and we want to find:

   1) S_4
   2) S_{10}
   3) S_{20}

2) Which of the following geometric sequences are convergent? If they are convergent, find the sum to infinity in each case.

   1) 12 + 18 + 27 + . . .

   2) 18 + 12 + 8 + . . .

   3) 64 – 48 + 36 – 27 + . . .

   4) 16 – 40 + 100 – 250 + . . .

   5) 1 – 1 + 1 – 1 + 1 – 1 + . . .

   6) $1-\frac{1}{2}+\frac{1}{4}-\frac{1}{8}+\frac{1}{16}-...$

3) The sum of the first two terms of a geometric sequence is 30, and the sum of the second and third terms is 20. Find the first term and the common ratio.

4) The numbers n + 3, 3n – 3, and 5n + 3 are consecutive terms of a geometric sequence. Find the possible values of n and of the common ratio. Find also the values of the three given terms in each case.

5) 1) What is the first term of the geometric sequence 3 + 12 + 48 + . . . to be greater than 1 000 000?

   2) How many terms of this geometric sequence are required in order to make a sum which is greater than 10^{10}?

6) Find a_1 and r for the geometric sequence with third term 20 and sixth term 160.