Geometric Sequences

Revision:

1. State the formula for the n^{th} term of a geometric sequence and what each term denotes. This is in your formula booklet.

2. A geometric sequence begins with: $4,\ x,\ 16\ldots$
   Show how to determine the value of r, which is called the _____ _____. This is not in your formula booklet.

3. Write down the two versions of the finite sum formula. These are both in your formula booklet.
   Challenge: when should you use each one?

   Formula 1 Formula 2

Practice:

1. The use of a calculator is permitted for this question.

   The first 3 terms of a geometric sequence are: $36, x+2, 9\ \ldots$

   a) Assuming the $u_2 > 0$, show that $x = 16$. (4 marks)
   b) Hence, find the value of r. (2 marks)
   c) Find the sum of the first 10 terms using a finite sum formula (2 marks)
   d) Find the sum of the first 100 terms using a finite sum formula (2 marks)

   Thinking question: What do you notice about your answers to b) and c)?

2. The following terms are part of a geometric sequence: $U_4 = 8$ and $U_6 = 128$.
    a. Show that $r = \pm 4$. (non-calculator)
    b. Assuming $r > 0$, calculate the value of u_1. (non-calculator)
    c. Find the sum of the first n terms to be greater than 1000. (calculator permitted)