Geometric series

Student name: _____ Score: _____

1. Consider the geometric sequence $2048, 1536, 1152, 864 \ldots$

Find the sum of the first 20 terms. [2]

2. The first three terms of a geometric sequence are $u_1 = 0.64$, $u_2 = 1.6$, and $u_3 = 4$.

(a) Find the value of r. [2]

(b) Find the value of S_6. [2]

(c) Find the least value of n such that $S_n > 75\,000$. [3]

3. The first term of a geometric sequence is 2 and the third term is 2.205.

Calculate the sum of the first 23 terms of the sequence.

4. In a geometric sequence, the fourth term is 8 times the first term. The sum of the first 10 terms is 2557.5. Find the 10th term of this sequence.

5. The sum of the first three terms of a geometric sequence is 62.755, and the sum of the infinite sequence is 440. Find the common ratio.

6. The fourth term, u_4, of a geometric sequence is 135. The fifth term, u_5, is 101.25.

Calculate the sum of the first 10 terms of the sequence. *[2 marks]*

7. Consider the geometric sequence $16, 8, a, 2, b, \ldots$

(a) Write down the common ratio. *[1 mark]*

(b) Write down the value of

(i) a;

(ii) b. *[2 marks]*

(c) The sum of the first n terms is 31.9375. Find the value of n. *[3 marks]*

8. Consider the sequence

$$512,\ 128,\ 32,\ 8,\ \ldots$$

(a) Calculate the exact value of the ninth term of the sequence. *[3 marks]*

(b) Calculate the least number of terms required for the sum of the sequence to be greater than 682.6 *[3 marks]*

Geometric series

Student name: ANSWERS Score: _____

1. Consider the geometric sequence $2048, 1536, 1152, 864 \ldots$

Find the sum of the first 20 terms. $S_{20} = 8170$ [2]

2. The first three terms of a geometric sequence are $u_1 = 0.64$, $u_2 = 1.6$, and $u_3 = 4$.

(a) Find the value of r. $r = 2.5$ [2]

(b) Find the value of S_6. $S_6 = 103.74$ [2]

(c) Find the least value of n such that $S_n > 75\,000$. $n = 14$ [3]

3. The first term of a geometric sequence is 2 and the third term is 2.205.

Calculate the sum of the first 23 terms of the sequence. $S_{23} = 82.9$

4. In a geometric sequence, the fourth term is 8 times the first term. The sum of the first 10 terms is 2557.5. Find the 10th term of this sequence. $u_{10} = 1280$

5. The sum of the first three terms of a geometric sequence is 62.755, and the sum of the infinite sequence is 440. Find the common ratio. $r = 0.95$

6. The fourth term, u_4, of a geometric sequence is 135. The fifth term, u_5, is 101.25.

Calculate the sum of the first 10 terms of the sequence. 1207.9 *[2 marks]*

7. Consider the geometric sequence $16, 8, a, 2, b, \ldots$

(a) Write down the common ratio. 0.5 *[1 mark]*

(b) Write down the value of

(i) a; 4

(ii) b. 1 *[2 marks]*

(c) The sum of the first n terms is 31.9375. Find the value of n. 9 *[3 marks]*

8. Consider the sequence

$$512,\ 128,\ 32,\ 8,\ \ldots$$

(a) Calculate the exact value of the ninth term of the sequence. $\frac{1}{128}$ *[3 marks]*

(b) Calculate the least number of terms required for the sum of the sequence to be greater than 682.6 7 *[3 marks]*