Geometric series

Student name: _____ Score: _____

1. Consider the geometric sequence 4374, 2916, 1944, 1296, 864, …

Find the sum of the first 16 terms.

2. The first three terms of a geometric sequence are $u_1 = 0.96$, $u_2 = 2.4$, $u_3 = 6$.

(a) Find the value of r.

(b) Find the value of S_6.

(c) Find the value of n such that $S_n > 80\,000$

3. The first term of a geometric sequence is 4 and the third term is 5.29.

Calculate

(a) The common ratio of the sequence.

(b) The sum of the first 24 terms of the sequence.

4. In a geometric sequence, the sixth term is 32 times the first term. The sum of the first 12 terms is 6142.5. Find the 12^{th} term of this sequence.

5. The fourth term, u_4, of a geometric sequence is 128. The fifth term, u_5, is 102.4.

(a) The common ratio of the sequence.

(b) Find u_1, the first term of the sequence.

(c) Calculate the sum of the first 10 terms of the sequence.

6. Consider the geometric sequence 20, 10, p, 2.5, q …

(a) Write down the common ratio, r.

(b) The sum of the first n terms is 39.6875. Find the value of n.

7. Consider the sequence

243, 81, 27, 9, …

(a) Calculate the exact value of the eighth term of the sequence.

(b) Calculate the least number of terms required for the sum of the sequence to be greater than 364.

8. The first term of a geometric sequence is 175 and the sum of the first five terms is 403.48

(a) Find the common ratio

(b) Find the tenth term

9. Alfredo walks to work each morning. During the first minute he walks 60 metres.

In each subsequent minute he walks 2% more than the distance walked during the previous minute.

The distance between his house and work is 1150 metres. Alfredo leaves his house at 08:00 and has to be at work at 08:15.

Explain why he will not be at work on time.

10. In a geometric series, $u_1 = \frac{1}{128}$ and $u_4 = \frac{1}{2}$

(a) Find the value of r.

(b) Find the smallest value of n for which $S_n > 170$

11. A teashop opened. During the first week their profit was \$60.
The teashop's profit increases by 10% every week.

Calculate the teashop's total profit for the first 8th weeks.

Geometric series

Student name: _____ANSWERS_____ Score: _____

1. Consider the geometric sequence 4374, 2916, 1944, 1296, 864, …

Find the sum of the first 16 terms. $S_{16} = 13\ 102.02$

2. The first three terms of a geometric sequence are $u_1 = 0.96$, $u_2 = 2.4$, $u_3 = 6$.

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

(b) Find the value of S_6. $S_6 = 155.61$

(c) Find the value of n such that $S_n > 80\ 000$ $n = 13$

3. The first term of a geometric sequence is 4 and the third term is 5.29.

Calculate

(a) The common ratio of the sequence. $r = 1.15$

(b) The sum of the first 24 terms of the sequence. $S_{24} = 736.67$

4. In a geometric sequence, the sixth term is 32 times the first term. The sum of the first 12 terms is 6142.5. Find the 12th term of this sequence. $u_{12} = 3072$

5. The fourth term, u_4, of a geometric sequence is 128. The fifth term, u_5, is 102.4.

(a) The common ratio of the sequence. $r = 0.8$

(b) Find u_1, the first term of the sequence. 250

(c) Calculate the sum of the first 10 terms of the sequence. 1115.8

6. Consider the geometric sequence 20, 10, p, 2.5, q …

(a) Write down the common ratio, r. $r = 0.5$

(b) The sum of the first n terms is 39.6875. Find the value of n. $n = 7$

7. Consider the sequence

243, 81, 27, 9, …

(a) Calculate the exact value of the eighth term of the sequence. $\frac{1}{9}$

(b) Calculate the least number of terms required for the sum of the sequence to be greater than 364. 6

8. The first term of a geometric sequence is 175 and the sum of the first five terms is 403.48

(a) Find the common ratio 0.6

(b) Find the tenth term 1.76

9. Alfredo walks to work each morning. During the first minute he walks 60 metres. In each subsequent minute he walks 2% more than the distance walked during the previous minute.

The distance between his house and work is 1150 metres. Alfredo leaves his house at 08:00 and has to be at work at 08:15.

Explain why he will not be at work on time. $n = 16.38651482$; since $n > 15$ he will be late

10. In a geometric series, $u_1 = \frac{1}{128}$ and $u_4 = \frac{1}{2}$

(a) Find the value of r. $r = 4$

(b) Find the smallest value of n for which $S_n > 170$ $n = 8$

11. A teashop opened. During the first week their profit was \$60. The teashop's profit increases by 10% every week.

Calculate the teashop's total profit for the first 8th weeks. \$686.15