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VCE Specialist Mathematics ½
Sequences and Series [1.3]
Test

Results:

Test	_____ / 19.5

Section A: Test Questions (19.5 Marks)

INSTRUCTION: 19.5 Marks. 20 Minutes Writing.

Question 1 (3.5 marks)

Tick whether the following statements are **true** or **false**.

	True	False
a. Recurrence relation is defining a term in terms of the previous term.		
b. The arithmetic mean of a and b is given by $\frac{a+b}{2}$.		
c. The sum of first 200 arithmetic terms is always given by $200a + 19900d$.		
d. A geometric sequence always has a positive common ratio.		
e. A geometric mean of a and b is given by ab.		
f. Infinite geometric sum always equals to $\frac{a}{1-r}$, regardless of the value of r.		

Space for Personal Notes

Question 2 (2 marks)

Find x, if $3x - 2$ is the arithmetic mean of $5x + 1$ and 11.

Question 3 (4 marks)

For the arithmetic sequence with $t_2 = -12$ and $S_{12} = 18$, find a, d, t_6 and S_6.

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Question 4 (3 marks)

It is known that two terms in a geometric sequence are $t_4 = 3$ and $t_7 = \frac{3}{64}$.

a. Find the value of r. (2 marks)

b. Hence, find t_n in terms of n. (1 mark)

Question 5 (2 marks)

For $t_n = 10 \cdot r^{n-1}$ it is known that the geometric mean of t_1 and t_5 is given by 90.

Find the value of r.

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Question 6 (5 marks)

Consider the following recurrence relation.

$$t_n = \frac{1}{3}t_{n-1} \text{ where } t_1 = 2$$

a. Define t_n in terms of n. (2 marks)

b. Find S_2. (2 marks)

c. Find the value of S_∞. (1 mark)

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VCE Specialist Mathematics ½

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