

**MATHEMATICS  
METHODS**

**Sequences and Series**

**Semester 2 2023**

# 

**Section One – Calculator Free**

Time allowed for this section

Working time for this section: 20 minutes

Marks available: 22 marks

## Material required/recommended for this section

##### To be provided by the supervisor

This Question/Answer booklet

Formula sheet

##### To be provided by the candidate

Standard items: pens, pencils, pencil sharpener, eraser, correction fluid, ruler, highlighters

Special items: drawing instruments, templates,

## Important note to candidates

No other items may be used in this section of the examination. It is **your** responsibility to ensure that you do not have any unauthorised notes or other items of a non-personal nature in the examination room. If you have any unauthorised material with you, hand it to the supervisor **before** reading any further.

1. (12 marks)  
   Define each of the following sequences recursively and state T6 :
2. 10, 8, 6, 4... [3]
3. 90, 100, 110, 120 ... [3]
4. 10, 20, 40, 80... [3]
5. 1000, 500, 250, 125 ... [3]
6. (10 marks)

Josh wants to increase the amount of time he spends studying leading up to his Year 12 exams.

He decides he will spend ‘a’ minutes studying the first week, ‘a + d’ minutes studying the second week, ‘a + 2d’ minutes studying the third week and so on.

In week 4 he studies for 120 minutes and in week 10 he studies for 5 hours.

1. Determine the value of a and d. [4]

1. His parents tell him that 12 hours a week is enough study. In which week will he reach 12 hours? [3]
2. Once he reaches 12 hours a week, he will maintain this for the rest of the year. If he studies for 40 weeks this year, write a calculation that can be used to calculate his total study for the year, in hours. [3]

**End of Section One**