

Name: \_\_\_\_\_

**IGCSE**

**Sequences (Higher)**

**Instructions**

- Use **black** ink or ball-point pen.
- Answer all questions.
- Answer the questions in the spaces provided  
– *there may be more space than you need.*
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working out.**

**Information**

- The marks for each question are shown in brackets  
– *use this as a guide as to how much time to spend on each question.*

**Advice**

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end

### Sample Paper 1H Question 23

1 The 4th term of an arithmetic series is 17

The 10th term of the same arithmetic series is 35

$$S_n = \frac{n}{2} (2a + (n-1)d)$$

Find the sum of the first 50 terms of this arithmetic series.

$$4^{\text{th}} \text{ term} = 17$$

$$a + 3d = 17$$

$$10^{\text{th}} \text{ term} = 35$$

$$a + 9d = 35$$

$$6d = 18$$

$$d = 3$$

$$S_{50} = \frac{50}{2} (2(8) + 49(3))$$

$$= \underline{\underline{4075}}$$

$$a + 3(3) = 17$$

$$a + 9 = 17$$

$$a = 8$$

(Total for Question 1 is 5 marks)

### June 2018 Paper 2H Question 23

2 The sum of the first 48 terms of an arithmetic series is 4 times the sum of the first 36 terms of the same series.

Find the sum of the first 30 terms of this series.

$$S_{48} = 4(S_{36})$$

$$\frac{48}{2}(2a + 47d) = 4 \left( \frac{36}{2}(2a + 35d) \right)$$

$$24(2a + 47d) = 72(2a + 35d)$$

$$48a + 1128d = 144a + 2520d$$

$$0 = 96a + 1392d$$

$$0 = 2a + 29d$$

$$S_{30} = \frac{30}{2}(2a + 29d)$$

$$= 15(0)$$

$$= \underline{\underline{0}}$$

0

(Total for Question 2 is 5 marks)

May 2019 Paper 1H Question 16

- 3 Here are the first five terms of an arithmetic sequence.

7    10    13    16    19

Find the sum of the first 100 terms of this sequence.

$$a = 7$$

$$d = 3$$

$$\begin{aligned} S_{100} &= \frac{100}{2} (2(7) + 99(3)) \\ &= 15550 \end{aligned}$$

15550

(Total for Question 3 is 2 marks)

January 2019 Paper 1H Question 21

- 4  $(2x + 23)$ ,  $(8x + 2)$  and  $(20x - 52)$  are three consecutive terms of an arithmetic sequence.

Prove that the common difference of the sequence is 12

$$\begin{aligned} d &= (8x + 2) - (2x + 23) & d &= (20x - 52) - (8x + 2) \\ &= 8x + 2 - 2x - 23 & &= 20x - 52 - 8x - 2 \\ &= 6x - 21 & &= 12x - 54 \end{aligned}$$

$$6x - 21 = 12x - 54$$

$$-21 = 6x - 54$$

$$33 = 6x$$

$$x = \frac{33}{6} = \frac{11}{2} = \underline{\underline{5.5}}$$

(Total for Question 4 is 4 marks)