

LC 2018: PAPER 1**QUESTION 5 (25 MARKS)****Question 5 (a) (i)**First row: $a = 4, d = 3$

$$S_{45} = \frac{45}{2}[2(4) + 44(3)] = 3150$$

Second row: $a = 7, d = 5$

$$S_{45} = \frac{45}{2}[2(7) + 44(5)] = 5265$$

Difference = $5265 - 3150 = 2115$

4	7	10	13		
7	12	17	22		
10	17	24	31		
13	22	31	40		

MARKING SCHEME NOTES**Question 5 (a) (i) [Scale 10C (0, 4, 8, 10)]**

- 4:** • Formulates S_{45} for row 1 or row 2
 • $3 + 5 + 7 \dots$
 • Identifies a or r for either row 1 or row 2
- 8:** • S_{45} found for row 1 or row 2
 Full credit -1: • Fails to subtract

Question 5 (a) (ii)

Find the value of the sixtieth cell in first column: 4, 7, 10, 13,...

$$a = 4, d = 3, n = 60$$

$$T_{60} = 4 + (59)(3) = 181$$

Find the common difference of the numbers in the sixtieth column: 3, 5, 7, 9,...

$$a = 3, d = 2, n = 60$$

$$T_{60} = 3 + (59)(2) = 121$$

Find the value of the seventieth cell in sixtieth column: 181, 302,...

$$a = 181, d = 121, n = 70$$

$$T_{70} = 181 + (69)(121) = 8530$$

MARKING SCHEME NOTES**Question 5 (a) (ii) [Scale 10D (0, 3, 5, 8, 10)]**

- 3:** • Identifies T_{60} in column 1 or T_{70} in row 1 or equivalent
 • Some relevant substitution into correct formula
 • Identifies a or d for either row 1 or row 2
- 5:** • Finds a in row 60 or row 70
 • Finds d in row 60 or row 70
- 8:** • Formulates substituted expression for T_{70} in row 60 or T_{60} in column 70
 • Finds both a and d in row 60 or row 70

Question 5 (b)

$$a_1 = 4, a_2 = 2$$

$$a_n = a_{n-1} - a_{n-2}$$

$$a_3 = a_2 - a_1 = 2 - 4 = -2$$

$$a_4 = a_3 - a_2 = -2 - 2 = -4$$

$$a_5 = a_4 - a_3 = -4 + 2 = -2$$

$$a_6 = a_5 - a_4 = -2 + 4 = 2$$

$$a_7 = a_6 - a_5 = 2 + 2 = 4$$

$$a_8 = a_7 - a_6 = 4 - 2 = 2$$

Sequence: 4, 2, -2, -4, -2, 2, 4, 2

The values repeat every 6 numbers.

$$\frac{2019}{6} = 336 + \text{Remainder} = 3 \Rightarrow a_{2019} = -2$$

MARKING SCHEME NOTES**Question 5 (b) [Scale 5C (0, 3, 4, 5)]**

3: • $a_3 = -2$

• $a_3 = a_2 - a_1$ or similar

5: • Any 4 from a_3, a_4, a_5, a_6, a_7 and a_8 found

Full credit -1: • $a_3, a_4, a_5, a_6,$ and a_{2019} found