Number Patterns: Linear Sequences (Grade 10)

EXAM-STYLE CLASS TEST

MARKS	DURATION	QUESTIONS
31	50 minutes	3

Name: ..... Class: .....

Date: .....

MARK ____ / 31

INSTRUCTIONS AND INFORMATION

1. Answer **ALL** the questions in this question paper.
2. Answer QUESTION 1 by **circling** the letter (A–D) in the answer grid at the end of that section.
3. Show **ALL** calculations clearly.
4. Show all units where applicable.
5. Number the answers correctly according to the numbering system used in this question paper.
6. A non-programmable calculator may be used, unless stated otherwise.
7. Write neatly and legibly.

QUESTION 1 [10 MARKS]

Four options are given as possible answers to the following questions. Choose the correct answer and circle the letter (A–D) in the grid at the end of this section. If you want to change your choice, put a cross through the wrong letter and circle your new choice.

1.1 The next term of 5 ; 9 ; 13 ; 17 ; ... is ... (1)

A) 34 **B)** 21

C) 22 **D)** 20

1.2 The general term of 5 ; 9 ; 13 ; 17 ; ... is ... (1)

A) $T_n = 5n - 1$ **B)** $T_n = 4n$

C) $T_n = n + 4$ **D)** $T_n = 4n + 1$

1.3 The 20th term of 5 ; 9 ; 13 ; ... is ... (1)

A) 100 **B)** 81

C) 85 **D)** 80

1.4 Which term of 5 ; 9 ; 13 ; ... is equal to 101? (1)

A) the 26th **B)** the 20th

C) the 101st **D)** the 25th

1.5 The constant difference of 20 ; 17 ; 14 ; 11 ; ... is ... (1)

A) -20 **B)** -3

C) 17 **D)** 3

1.6 If $T_n = 3n - 7$, then the FIRST term is ... (1)

A) 7 **B)** 3

C) -4 **D)** -7

1.7 A pattern of figures uses 4, 7, 10 and 13 matchsticks. Its general term is ... (1)

A) $T_n = 3n + 1$ **B)** $T_n = n + 3$

C) $T_n = 4n$ **D)** $T_n = 3n$

1.8 How many matchsticks does the 50th figure of that pattern need? (1)

A) 200 **B)** 150

C) 151 **D)** 154

1.9 A sequence is LINEAR when ... (1)

A) all its terms are positive **B)** its second difference is constant

C) each term is double the one before **D)** its first difference is constant

1.10 For the sequence 2 ; 5 ; 8 ; ..., the value of $T_1 + T_{10}$ is ... (1)

A) 31 **B)** 29

C) 30 **D)** 32

ANSWER GRID — CIRCLE YOUR ANSWERS FOR QUESTION 1

1.1	A	B	C	D
1.2	A	B	C	D
1.3	A	B	C	D
1.4	A	B	C	D
1.5	A	B	C	D
1.6	A	B	C	D
1.7	A	B	C	D
1.8	A	B	C	D
1.9	A	B	C	D
1.10	A	B	C	D

QUESTION 2 [12 MARKS]

$3x + 1$; $2x$; $3x - 7$ are the first three terms of a LINEAR pattern.

2.1 Calculate the value of x. (3)

2.2 Determine the numerical value of the first three terms. (2)

2.3 Determine T_n, the general term of the pattern. **(3)**

2.4 Determine which term will be the FIRST to be less than -31. **(4)**

QUESTION 3 [9 MARKS]

Consider the linear pattern 5 ; 8 ; 11 ; 14 ; ...

3.1 Determine the general term T_n. **(3)**

3.2 Calculate T_{50}. **(2)**

3.3 Determine whether 100 is a term of this pattern. Justify your answer. **(4)**

TOTAL: 31 marks

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