EXAM-STYLE CLASS TEST

MARKS	DURATION	QUESTIONS
34	55 minutes	3

Name: _____ Class: _____

Date: _____

MARK _____ / 34

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 In a QUADRATIC number pattern, the second difference is ... (1)

A) equal to the first difference **B)** constant
C) zero **D)** increasing

1.2 For the pattern $204\ ;\ 176\ ;\ 150\ ;\ 126\ ;\ \ldots$, the SECOND difference is ... (1)

A) -26 **B)** -2
C) 2 **D)** -28

1.3 The next TWO terms of $204\ ;\ 176\ ;\ 150\ ;\ 126\ ;\ \ldots$ are ... (1)

A) 104 and 82 **B)** 104 and 84
C) 102 and 78 **D)** 100 and 74

1.4 For $T_n = an^2 + bn + c$, the value of a is ... (1)

A) half the second difference **B)** the first term
C) the second difference itself **D)** the first difference

1.5 The general term of $204\ ;\ 176\ ;\ 150\ ;\ 126\ ;\ \ldots$ is ... (1)

A) $T_n = n^2 - 31n + 234$ **B)** $T_n = 2n^2 - 31n + 234$
C) $T_n = n^2 + 31n + 234$ **D)** $T_n = n^2 - 28n + 231$

1.6 A quadratic pattern with $a > 0$ has ... (1)

A) a constant first difference **B)** no turning term
C) a minimum term **D)** a maximum term

1.7 The general term of $3\ ;\ 8\ ;\ 17\ ;\ 30\ ;\ \ldots$ is ... (1)

A) $T_n = 2n^2 - n$ **B)** $T_n = 2n^2 + n + 2$

C) $T_n = 4n^2 - n + 2$ **D)** $T_n = 2n^2 - n + 2$

1.8 For $T_n = n^2 - 31n + 234$, the SMALLEST term occurs at ... (1)

A) $n = 15{,}5$ **B)** $n = 1$

C) $n = 31$ **D)** $n = 15$ and $n = 16$, which are equal

1.9 For $T_n = n^2 - 31n + 234$, the number of NEGATIVE terms is ... (1)

A) 5 **B)** 4

C) 2 **D)** 6

1.10 The FIRST differences of a quadratic pattern themselves form ... (1)

A) a linear pattern **B)** a constant pattern

C) a quadratic pattern **D)** a geometric pattern

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]

A quadratic number pattern $T_n = an^2 + bn + c$ has these properties:

- $T_1 = -2$
- the n^{th} term of the FIRST differences is $-6n - 2$

2.1 Show that $a = -3$ and $b = 1$. (4)

2.2 Hence determine the general term T_n. **(3)**

2.3 Determine whether $-19\,122$ is a term of the sequence. Justify your answer with calculations. **(5)**

QUESTION 3 [12 MARKS]

Consider the quadratic pattern 3 ; 8 ; 17 ; 30 ; 47 ; ...

3.1 Show that the pattern is quadratic and determine its general term. **(5)**

3.2 Determine which term of the pattern is equal to 122. **(4)**

3.3 Determine the value of the FIRST difference between T_{20} and T_{21}. **(3)**

TOTAL: 34 marks

This question paper consists of 3 questions.

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