EXAM-STYLE CLASS TEST

MARKS	DURATION	QUESTIONS
36	55 minutes	3

Name: _____ Class: _____

Date: _____

MARK ____ / 36

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 turning point of $y = 2(x - 3)^2 + 5$ is ... (1)

A) $(3\ ;\ -5)$ **B)** $(2\ ;\ 3)$

C) $(3\ ;\ 5)$ **D)** $(-3\ ;\ 5)$

1.2 The turning point of $y = (x + 4)^2 - 1$ is ... (1)

A) $(-4\ ;\ -1)$ **B)** $(4\ ;\ 1)$

C) $(4\ ;\ -1)$ **D)** $(-4\ ;\ 1)$

1.3 The range of $y = -3(x - 1)^2 + 7$ is ... (1)

A) $y \leq -3$ **B)** $y \geq 7$

C) $y \geq 1$ **D)** $y \leq 7$

1.4 The axis of symmetry of $y = 2(x + 5)^2 - 3$ is ... (1)

A) $x = 2$ **B)** $x = -5$

C) $y = -3$ **D)** $x = 5$

1.5 $y = x^2 - 4x + 1$ in the form $a(x + p)^2 + q$ is ... (1)

A) $y = (x + 2)^2 - 3$ **B)** $y = (x - 2)^2 + 1$

C) $y = (x - 4)^2 - 15$ **D)** $y = (x - 2)^2 - 3$

1.6 A parabola has turning point $(2\ ;\ -5)$ and passes through $(0\ ;\ 3)$. Its equation is ... (1)

A) $y = (x - 2)^2 - 5$ **B)** $y = 2(x - 2)^2 - 5$

C) $y = 2(x + 2)^2 - 5$ **D)** $y = 8(x - 2)^2 - 5$

1.7 If $a > 0$, the graph of $y = a(x + p)^2 + q$ has ... (1)

A) a minimum value of p **B)** no turning point

C) a maximum value of q **D)** a minimum value of q

1.8 The y-intercept of $y = 2(x - 3)^2 + 5$ is ... (1)

A) 5 **B)** 18

C) 23 **D)** 9

1.9 How many x-intercepts does $y = 2(x - 3)^2 + 5$ have? (1)

A) one **B)** two

C) none **D)** three

1.10 Reflecting $y = (x - 1)^2 + 2$ in the x-axis gives ... (1)

A) $y = -(x - 1)^2 - 2$ **B)** $y = (x + 1)^2 + 2$

C) $y = (x - 1)^2 - 2$ **D)** $y = -(x - 1)^2 + 2$

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 [13 MARKS]

The parabola $f(x) = -2(x - 1)^2 + 8$ is given.

2.1 Write down the coordinates of the turning point and the equation of the axis of symmetry, and state whether the turning point is a maximum or a minimum, with a reason. (3)

2.2 Calculate the x-intercepts of f. **(4)**

2.3 Write f in the form $y = ax^2 + bx + c$. **(3)**

2.4 Write down the range of f, and give a reason. **(3)**

QUESTION 3 [13 MARKS]

Answer the questions below about the same parabola.

3.1 For which values of x is $f(x) \geq 0$? Give your answer in interval notation. **(3)**

3.2 For which values of x is f increasing? Hence, using your answer to the previous part, for which values of x is f increasing AND $f(x) > 0$? **(4)**

3.3 Determine the value(s) of k for which $f(x) = k$ has NO real roots. **(3)**

3.4 Describe the transformation that maps f onto $g(x) = -2(x-1)^2 + 3$, and write down the turning point of g. **(3)**

TOTAL: 36 marks

This question paper consists of 3 questions.

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