EXAM-STYLE CLASS TEST

MARKS	DURATION	QUESTIONS
39	1 hour	3

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

Date: .....

MARK ____ / 39

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 asymptotes of $y = \frac{2}{x-1} + 3$ are ... (1)

A) $x = 3$ and $y = 1$
B) $x = 1$ and $y = 0$
C) $x = 1$ and $y = 3$
D) $x = -1$ and $y = 3$

1.2 The y-intercept of $y = \frac{-2}{x-1} + 3$ is ... (1)

A) 5
B) -2
C) 1
D) 3

1.3 The domain of $y = \frac{3}{x+2}$ is ... (1)

A) $x \in \mathbb{R}, x \neq -2$
B) $x \in \mathbb{R}, x \neq 2$
C) $x \in \mathbb{R}$
D) $x > -2$

1.4 The range of $y = \frac{4}{x-1} - 2$ is ... (1)

A) $y \in \mathbb{R}, y \neq 0$
B) $y > -2$
C) $y \in \mathbb{R}, y \neq 1$
D) $y \in \mathbb{R}, y \neq -2$

1.5 The axes of symmetry of $y = \frac{a}{x}$ are ... (1)

A) $y = x$ only
B) $y = x$ and $y = -x$
C) it has none
D) the x-axis and the y-axis

1.6 For $y = \frac{a}{x-1} + 3$, the axis of symmetry with a POSITIVE gradient is ... (1)

A) $y = x - 2$ **B)** $y = -x + 4$

C) $y = x$ **D)** $y = x + 2$

1.7 The asymptote of $y = 3(2^x) - 6$ is ... (1)

A) $y = 3$ **B)** $y = 0$

C) $y = -6$ **D)** $x = 0$

1.8 The x-intercept of $y = 3(2^x) - 6$ is ... (1)

A) $x = 2$ **B)** $x = 1$

C) $x = 6$ **D)** $x = 0$

1.9 The y-intercept of $y = 3(2^x) - 6$ is ... (1)

A) 0 **B)** -6

C) 3 **D)** -3

1.10 As x becomes very large and NEGATIVE, the graph of $y = 3(2^x) - 6$ approaches ... (1)

A) $y = 0$ **B)** $y = -6$ from above

C) no limiting value at all **D)** $y = -6$ from below

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 [15 MARKS]

Given the hyperbola $g(x) = \frac{4}{x-2} + 1$.

2.1 Write down the equations of the asymptotes, and explain how each one is read off the equation. (3)

2.2 Calculate the coordinates of the intercepts with the axes. **(5)**

2.3 Write down the equations of the two axes of symmetry of g. **(4)**

2.4 Write down the domain and the range of g, and explain why each one excludes exactly ONE value. **(3)**

QUESTION 3 [14 MARKS]

Given the exponential function $h(x) = 2(3)^x - 6$.

3.1 Write down the equation of the asymptote of h, and explain why the graph never reaches it. **(3)**

3.2 Calculate the coordinates of the intercepts with the axes. **(5)**

3.3 Write down the range of h, and explain why h has exactly ONE x-intercept. **(3)**

3.4 Determine the equation of the graph obtained when h is shifted 2 units to the LEFT. **(3)**

TOTAL: 39 marks

This question paper consists of 3 questions.

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