EXAM-STYLE CLASS TEST

MARKS	DURATION	QUESTIONS
35	55 minutes	3

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

Date: .....

MARK ____ / 35

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 inverse of a function is found by ... (1)

A) taking the reciprocal of the function
B) reflecting in the y-axis
C) swapping x and y, then making y the subject
D) changing the sign of y

1.2 The graph of f^{-1} is the reflection of f in the line ... (1)

A) $y = x$
B) the y-axis
C) $y = -x$
D) the x-axis

1.3 The inverse of $f(x) = 3x - 6$ is ... (1)

A) $3x + 6$
B) $\frac{1}{3x - 6}$
C) $\frac{x + 6}{3}$
D) $\frac{x - 6}{3}$

1.4 The inverse of $f(x) = x^2$ for $x \geq 0$ is ... (1)

A) x^2
B) $\sqrt{x}$
C) $\frac{1}{x^2}$
D) $-\sqrt{x}$

1.5 Why must the domain of $f(x) = x^2$ be restricted before it has an inverse function? (1)

A) the inverse would otherwise be a straight line
B) x^2 is undefined for negative x
C) x^2 has no y-intercept
D) without the restriction the inverse fails the vertical line test

1.6 If $f(x) = 2^x$, then $f^{-1}(x) = \ldots$ (1)

A) x^2 **B)** $\log_2 x$

C) 2^{-x} **D)** $\frac{1}{2^x}$

1.7 The DOMAIN of f^{-1} is ... (1)

A) the range of f **B)** always $x > 0$

C) the domain of f **D)** always all real x

1.8 If $(3\ ;\ 7)$ lies on f, then f^{-1} passes through ... (1)

A) $(7\ ;\ 3)$ **B)** $(-7\ ;\ 3)$

C) $(3\ ;\ 7)$ **D)** $(-3\ ;\ -7)$

1.9 For $a \neq 0$, the inverse of $y = ax$ is ... (1)

A) $\frac{a}{x}$ **B)** ax

C) $-ax$ **D)** $\frac{x}{a}$

1.10 A function's inverse is itself a function only when the original is ... (1)

A) always increasing **B)** many-to-one

C) one-to-one **D)** continuous

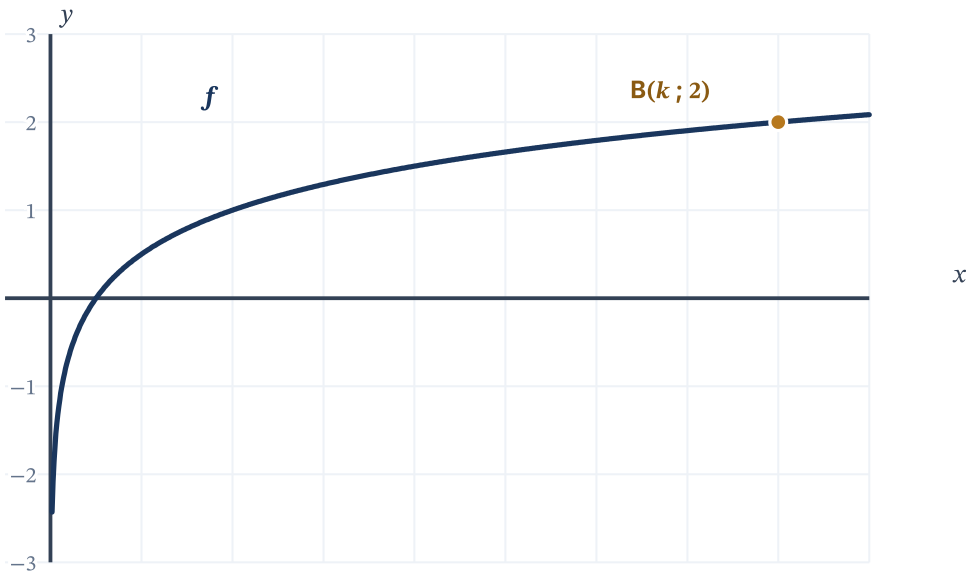
ANSWER GRID — CIRCLE YOUR ANSWERS FOR QUESTION 1

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]

The graph of $f(x) = \log_4 x$ is drawn. B$(k\ ;\ 2)$ is a point on f.



2.1 Calculate the value of k, and hence write down the coordinates of the point at which f cuts the x-axis. **(3)**

2.2 Determine the values of x for which $-1 \leq f(x) \leq 2$. **(3)**

2.3 Write down the equation of f^{-1}, the inverse of f, in the form $y = \ldots$, and state its domain. **(3)**

2.4 For which values of x will $x \cdot f^{-1}(x) \leq 0$? **(3)**

QUESTION 3 [13 MARKS]

Given $g(x) = 2x^2$ for $x \geq 0$.

3.1 Determine the equation of g^{-1} in the form $y = \ldots$ **(4)**

3.2 Write down the domain and the range of g^{-1}, and say where each one comes from. **(3)**

3.3 Explain why the inverse of g would NOT be a function if the domain of g were not restricted. **(3)**

3.4 Describe the geometric relationship between the graphs of g and g^{-1}, and hence determine the coordinates of the point, other than the origin, at which they intersect. **(3)**

TOTAL: 35 marks

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