



Name: _____ Date: _____

IBSL Year 1

Functions Test - Paper 2

Score: /19

CAC%:

IB:

INSTRUCTIONS TO CANDIDATES

- Write your session number in the boxes above.
- Do not open this examination paper until instructed to do so.
- A graphic display calculator is required for this paper.
- Section A: answer all questions in the boxes provided.
- Unless otherwise stated in the question, all numerical answers should be given exactly or correct to three significant figures.
- A clean copy of the *Mathematics SL formula booklet* is required for this paper.
- The maximum mark for this examination paper is [22 marks].

Full marks are not necessarily awarded for a correct answer with no working. Answers must be supported by working and/or explanations. In particular, solutions found from a graphic display calculator should be supported by suitable working, for example if graphs are used to find a solution, you should sketch these as part of your answer. Where an answer is incorrect, some marks may be given for a correct method, provided this is shown by written working. You are therefore advised to show all working.

Section A

Answer **all** questions in the space provided. Working may be continued in the answer booklet.

1a. Let $f(x) = 2x + 4$ and $g(x) = 7x^2$.

Find $f^{-1}(x)$.

[3 marks]

1b. Find $(f \circ g)(x)$.

[2 marks]

1c. Find $(f \circ g)(3.5)$.

[2 marks]

2a. Let f and g be functions such that $g(x) = 2f(x + 1) + 5$.

(a) The graph of f is mapped to the graph of g under the following transformations:

vertical stretch by a factor of k , followed by a translation $\begin{pmatrix} p \\ q \end{pmatrix}$.

Write down the value of

(i) k ;

(ii) p ;

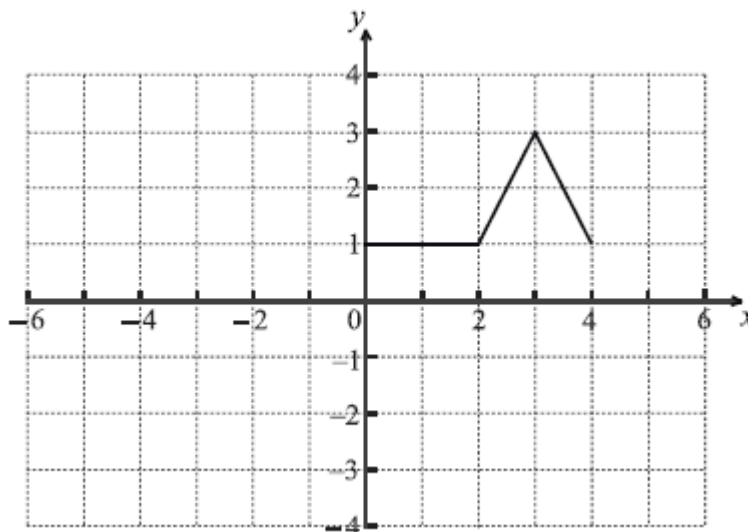
(iii) q .

[3 marks]

2b. Let $h(x) = -g(3x)$. The point $A(6, 5)$ on the graph of g is mapped to the point A' on the graph of h . Find A' .

[3 marks]

3a. Consider the graph of f shown below.



On the **same** grid sketch the graph of $y = f(-x)$.

[2 marks]

3b. The following four diagrams show **images** of f under different transformations.

Diagram A

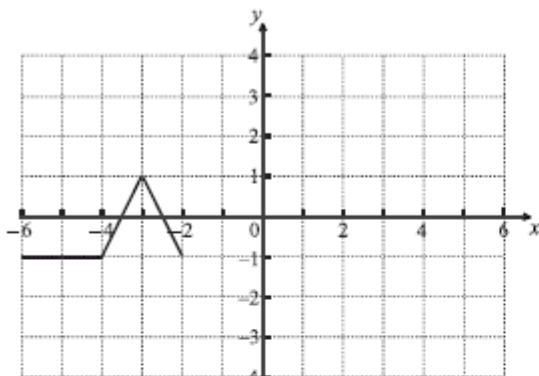


Diagram B

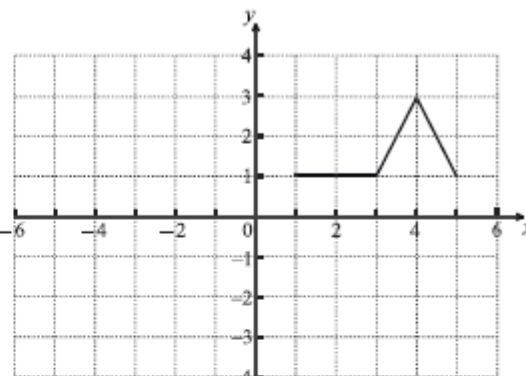


Diagram C

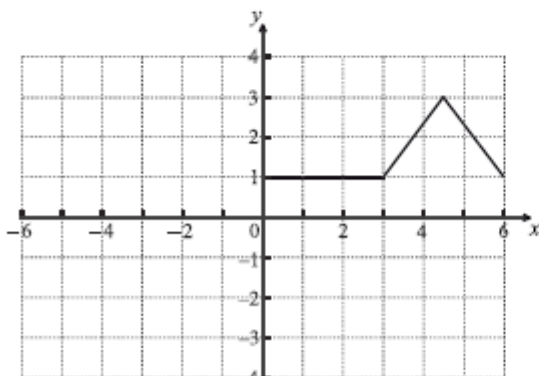
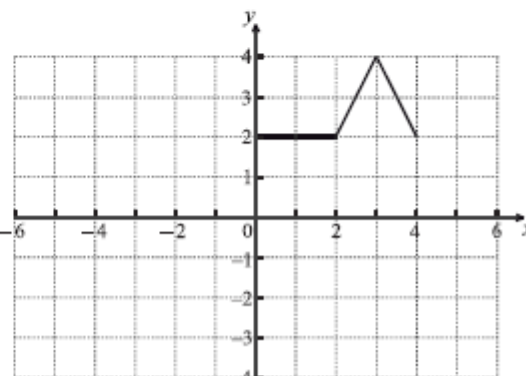


Diagram D



Complete the following table.

Description of transformation	Diagram letter
Horizontal stretch with scale factor 1.5	
Maps f to $f(x)+1$	

[2 marks]

3c. Give a full geometric description of the transformation that gives the image in Diagram A.

[2 marks]