



## Cambridge International AS & A Level

CANDIDATE  
NAME

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CENTRE  
NUMBER

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CANDIDATE  
NUMBER

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\* 1 3 6 0 5 2 4 7 3 1 \*

**MATHEMATICS**

**9709/13**

Paper 1 Pure Mathematics 1

**May/June 2020**

**1 hour 50 minutes**

You must answer on the question paper.

You will need: List of formulae (MF19)

### INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- If additional space is needed, you should use the lined page at the end of this booklet; the question number or numbers must be clearly shown.
- You should use a calculator where appropriate.
- You must show all necessary working clearly; no marks will be given for unsupported answers from a calculator.
- Give non-exact numerical answers correct to 3 significant figures, or 1 decimal place for angles in degrees, unless a different level of accuracy is specified in the question.

### INFORMATION

- The total mark for this paper is 75.
- The number of marks for each question or part question is shown in brackets [ ].

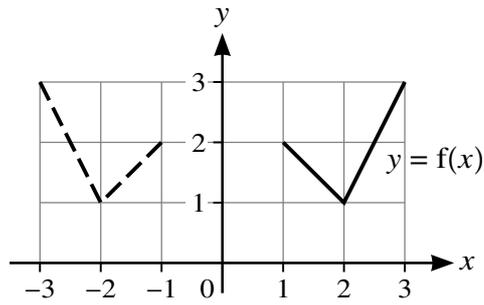
This document has **20** pages. Blank pages are indicated.





- 3 In each of parts (a), (b) and (c), the graph shown with solid lines has equation  $y = f(x)$ . The graph shown with broken lines is a transformation of  $y = f(x)$ .

(a)

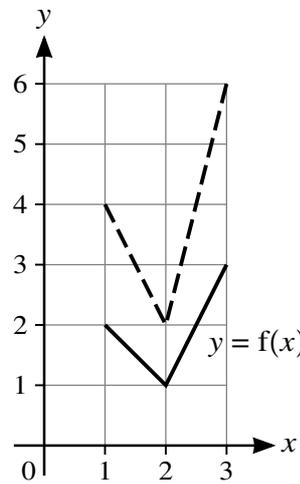


State, in terms of  $f$ , the equation of the graph shown with broken lines.

[1]

.....

(b)

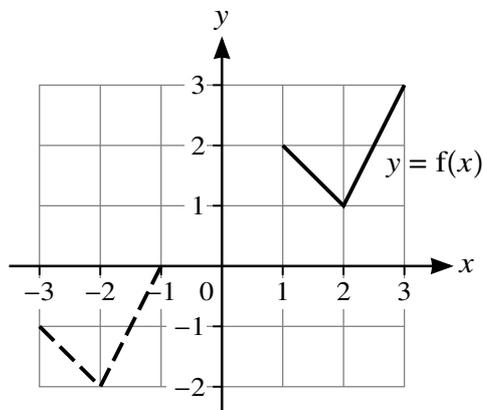


State, in terms of  $f$ , the equation of the graph shown with broken lines.

[1]

.....

(c)



State, in terms of  $f$ , the equation of the graph shown with broken lines.

[2]

.....































