

**MATHEMATICS: PAPER I**  
**MARKING GUIDELINES**

Time: 3 hours

150 marks

**ANSWER SHEET**

**QUESTION 5**

(a) Given  $p(x) = -3x^2$

Determine the equation of the inverse of  $p$  stating its domain and range. (5)

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Inverse :  $x = -3y^2$  A

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$y^2 = -\frac{x}{3}$  M Changing subject of formula

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Must be shown  $y \Rightarrow \pm \sqrt{-\frac{x}{3}}$  A

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Domain :  $x \leq 0$  A

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Range :  $y \in R$  A

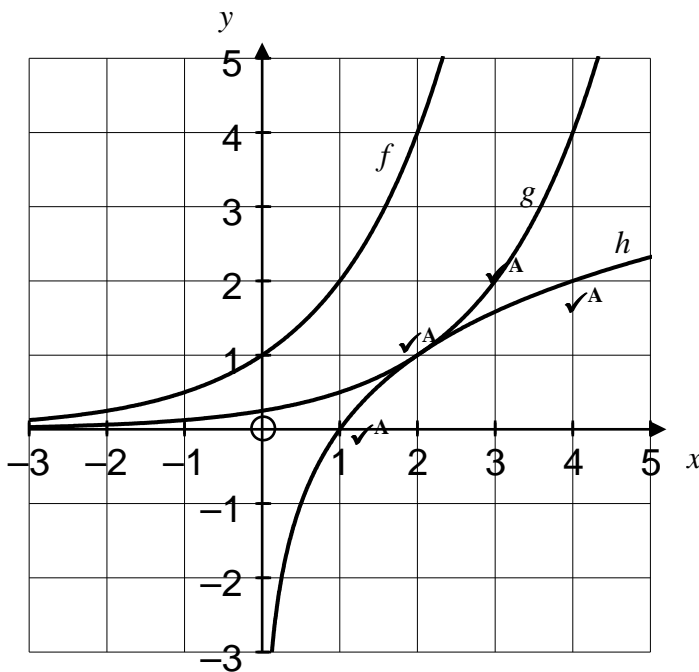
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(b) Given  $f(x) = 2^x$ ,  $g(x) = f(x-2)$  and  $h(x) = f^{-1}(x)$

(1) Write down the equations of  $g$  and  $h$  in the form  $y = \dots$  (2)

$g : y = 2^{x-2}$	A
$h : y = \log_2 x$	A

(2) On the set of axes where  $f$  is already drawn for you, add the graphs for  $g$  and  $h$ . Label your graphs clearly. (4)



Exp  
 $g$ : shape  
 (2; 1) or (3; 2) or (4; 4)

Log  
 $h$ : shape  
 (1; 0)  
 (2; 1)  
 or (4; 2) } All

exp: crossing x-axis  
 or log crossing y-axis } Shape mark  
 not given

(3) Solve for  $x$  if  $g(x) = h(x)$ . (1)

$x = 2$	CA
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[12]