

SAMPLE PAPER 2: PAPER 1

QUESTION 5 (25 MARKS)

Question 5 (a)

Yes. Each value of y corresponds to only one value of x .

Question 5 (b)

$$f(x) = y = 2^x$$

$$\log_2 y = \log_2 2^x$$

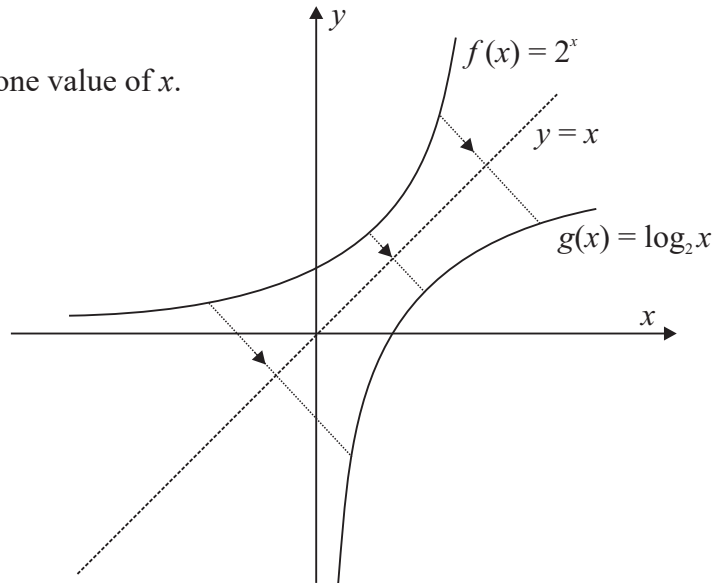
$$\log_2 y = x \log_2 2$$

$$\log_2 y = x$$

$$\therefore f^{-1}(x) = \log_2 y = g(x)$$

$g(x)$ is the inverse function of $f(x)$.

Reflect the curve for $f(x)$ by an axial symmetry through the line $y = x$ to get its inverse function.



Question 5 (c)

It is not injective because certain values of y correspond to two values of x .

Question 5 (d)

$$x = 0 \Rightarrow y = 2^0 = 1$$

$$\therefore A(0, 1)$$

$$(0, 1) \in h(x) \Rightarrow 1 = -(-1)^2 + a$$

$$\therefore a = 2$$

$$h(x) = 2 - (x - 1)^2$$

Question 5 (e)

Local maximum is at $y = 2$.

$$h(x) = 2 - (x - 1)^2$$

$$\therefore 2 = 2 - (x - 1)^2$$

$$(x - 1)^2 = 0$$

$$x - 1 = 0$$

$$\therefore x = 1$$

Local Maximum $B(1, 2)$

$$B(1, 2) \in f(x)?$$

$$f(x) = 2^x$$

$$2 = 2^1 \text{ (True)}$$

