IGCSE – Functions and Graphs – 1

May 03 Paper 4

4 **Answer the whole of this question on a sheet of graph paper.**

x	−4	−3	−2	−1	0	1	2	3	4
f(x)	−8	4.5	8	5.5	0	−5.5	−8	−4.5	8

(a) Using a scale of 2 cm to represent 1 unit on the x-axis and 2 cm to represent 4 units on the y-axis, draw axes for $-4 \leqslant x \leqslant 4$ and $-8 \leqslant y \leqslant 8$.
Draw the curve $y = f(x)$ using the table of values given above. [5]

(b) Use your graph to solve the equation $f(x) = 0$. [2]

(c) On the same grid, draw $y = g(x)$ for $-4 \leqslant x \leqslant 4$, where $g(x) = x + 1$. [2]

(d) Write down the value of

(i) g(1),

(ii) fg(1),

(iii) $g^{-1}(4)$,

(iv) the **positive** solution of $f(x) = g(x)$. [4]

(e) Draw the tangent to $y = f(x)$ at $x = 3$. Use it to calculate an estimate of the gradient of the curve at this point. [3]

Oct 04 Paper 4

9 **(a)** $f(x) = 2^x - 3x$ and $g(x) = x^2$.

(i) Solve the equation $f(x) = 7 - x$. [2]

(ii) Find $f^{-1}(x)$. [2]

(iii) Find the value of gf(2) – fg(2). [3]

(iv) Find fg(x). [1]

(b) $h(x) = x^x$.

(i) Find the value of h(2). [1]

(ii) Find the value of h(−3), giving your answer as a fraction. [1]

(iii) Find the value of h(7.5), giving your answer in standard form. [2]

(iv) h(−0.5) is not a real number. Explain why. [1]

(v) Find the integer value for which $h(x) = 3125$. [1]