Subject – Math AA(Standard Level)
Topic - Functions
Year   - May 2021 – Nov 2022
Paper -1
Questions

Question 1
[Maximum mark: 5]

The functions f and g are defined such that $f(x) = \dfrac{x+3}{4}$ and $g(x) = 8x + 5$.

(a)   Show that $(g \circ f)(x) = 2x + 11$.   [2]

(b)   Given that $(g \circ f)^{-1}(a) = 4$, find the value of a.   [3]

Question 2
[Maximum mark: 14]

Let $f(x) = mx^2 - 2mx$, where $x \in \mathbb{R}$ and $m \in \mathbb{R}$. The line $y = mx - 9$ meets the graph of f at exactly one point.

(a)   Show that $m = 4$.   [8]

The function f can be expressed in the form $f(x) = 4(x - p)(x - q)$, where $p, q \in \mathbb{R}$.

(b)   Find the value of p and the value of q.   [2]

The function f can also be expressed in the form $f(x) = 4(x - h)^2 - k$, where $h, k \in \mathbb{R}$.

(c)   Find the value of h and the value of k.   [3]

(d)   Hence find the values of x where the graph of f is both negative and increasing.   [3]

Math Ib Sl 2013 Paper Tz1

Professor in the Department of Pure Mathematics Terry Wall,Ric Pimentel

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