Name:

QUIZ 22 – MATH IB HL

1. (38%) Given that: f(x) = $\ln(x-1)+x$, g(x) = $e^{-2x}+1$, s(x) = $\frac{x+1}{3-2x}$, find:

   a. (4%) Find, simplified.

   f(g(x)) =

   b. (4%) s(g(0)) =

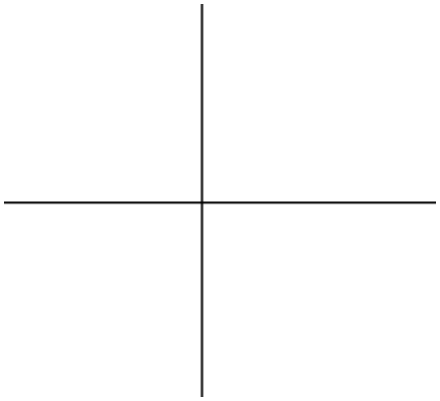
   c. (4%) $s^{-1}(-2)$ =

   d. (4%) $g \circ f(e+1)$

   e. (4%) $s^{-1}(s(x))$ =

   f. (4%) g(___) = e + 1

   g. (10%) Sketch g(x) and $g^{-1}(x)$ on the same graph, write down the coordinates of all intercepts and asymptotes. Illustrate the asymptotes on the graph.



   h. (4%) f(x) is _____ of $f^{-1}(x)$

2. (10%) Given that $f(x) = 5 - 2^{3-2x}$, find the inverse function $f^{-1}(x)$.

3. (15%) Consider the functions $f : x \mapsto 10(x - 1)$ and $g : x \mapsto \dfrac{x+1}{3-2x}$.

(a) (8%) Find g^{-1}.

(b) (7%) Solve the equation $(f \circ g^{-1})(x) = 4$.

4. (10%) Given the function: H(x) = sin(10x) and

   a. (4%) $H\left(\frac{\pi}{6}\right)$ =

   b. (6%) H(x) can be written in the form 2sin(kx)cos(kx), find k.

5. (14%) The function f is given by $f(x) = 2x^2 + 12x + 23$, for $x \geq -3$.

   (a) (5%) Write $f(x)$ in the form $k(x + a)^2 + b$.

   (b) (5%) Find the inverse function f^{-1}.

   (c) (4%) State the domain of f^{-1}.

6. (13%) Consider the function f, where $f(x) = (\ln(\sin(x))$ and $0 \leq x < 6$

(a) (7%) Find the exact domain of f.

(b) (6%) Find $f^{-1}(x)$.