1. A function f is defined by $f(x) = \dfrac{2x-3}{x-1}$, $x \neq 1$.

(a) Find an expression for $f^{-1}(x)$.

(3)

(b) Solve the equation $\left| f^{-1}(x) \right| = 1 + f^{-1}(x)$.

(3)
(Total 6 marks)

2. Let $f(x) = \dfrac{4-x^2}{4-\sqrt{x}}$.

(a) State the largest possible domain for f.

(2)

(b) Solve the inequality $f(x) \geq 1$.

(4)
(Total 6 marks)

3. Find the set of values of x for which $\left| x - 1 \right| > \left| 2x - 1 \right|$. (Total 4 marks)

4. Find all values of x that satisfy the inequality $\frac{2x}{|x-1|} < 1$.

(Total 5 marks)

5. Let $f(x) = \frac{x+4}{x+1}$, $x \neq -1$ and $g(x) = \frac{x-2}{x-4}$, $x \neq 4$. Find the set of values of x such that $f(x) \leq g(x)$.

(Total 6 marks)