

10 A function f is defined by $f : x \mapsto 5 - 2 \sin 2x$ for $0 \leq x \leq \pi$.

(i) Find the range of f . [2]

(ii) Sketch the graph of $y = f(x)$. [2]

(iii) Solve the equation $f(x) = 6$, giving answers in terms of π . [3]

The function g is defined by $g : x \mapsto 5 - 2 \sin 2x$ for $0 \leq x \leq k$, where k is a constant.

(iv) State the largest value of k for which g has an inverse. [1]

(v) For this value of k , find an expression for $g^{-1} x$. [3]