

11 The function f is defined by $f : x \mapsto 2x^2 - 6x + 5$ for $x \in \mathbb{R}$.

- (i) Find the set of values of p for which the equation $f(x) = p$ has no real roots. [3]

The function g is defined by $g : x \mapsto 2x^2 - 6x + 5$ for $0 \leq x \leq 4$.

- (ii) Express $g(x)$ in the form $a(x + b)^2 + c$, where a , b and c are constants. [3]

- (iii) Find the range of g . [2]

The function h is defined by $h : x \mapsto 2x^2 - 6x + 5$ for $k \leq x \leq 4$, where k is a constant.

- (iv) State the smallest value of k for which h has an inverse. [1]

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