9. The function f is defined by

$$f(x) = (x - 7)^2 + 5 \qquad x \in \mathbb{R}$$

(a) Explain why f does not have an inverse.

(1)

The function g is defined by

$$g(x) = (x - 7)^2 + 5 \qquad x \geqslant k$$

where k is a constant.

Given that g has an inverse,

(b) deduce the smallest possible value of k

(1)

Given also that there is a unique solution to $g(x) = x$

(c) find the range of values for k

(3)

Using the value of k found in part (b),

(d) find g^{-1}

(3)