8 **(i)** Express $x^2 - 4x + 7$ in the form $(x + a)^2 + b$. [2]

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The function f is defined by $f(x) = x^2 - 4x + 7$ for $x < k$, where k is a constant.

(ii) State the largest value of k for which f is a decreasing function. [1]

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The value of k is now given to be 1.

(iii) Find an expression for $f^{-1}(x)$ and state the domain of f^{-1}. [3]

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(iv) The function g is defined by $g(x) = \frac{2}{x-1}$ for $x > 1$. Find an expression for $gf(x)$ and state the range of gf. [4]