**10** The function f is defined by $\mathrm{f} : x \mapsto 2x + k$, $x \in \mathbb{R}$, where $k$ is a constant.

**(i)** In the case where $k = 3$, solve the equation $\mathrm{ff}(x) = 25$. [2]

The function g is defined by $\mathrm{g} : x \mapsto x^2 - 6x + 8$, $x \in \mathbb{R}$.

**(ii)** Find the set of values of $k$ for which the equation $\mathrm{f}(x) = \mathrm{g}(x)$ has no real solutions. [3]

The function h is defined by $\mathrm{h} : x \mapsto x^2 - 6x + 8$, $x > 3$.

**(iii)** Find an expression for $\mathrm{h}^{-1}(x)$. [4]