9 The function f is defined by f : $x \mapsto 2x^2 - 12x + 7$ for $x \in \mathbb{R}$.

   (i) Express f(x) in the form $a(x - b)^2 - c$.   [3]

   (ii) State the range of f.   [1]

   (iii) Find the set of values of x for which f$(x) < 21$.   [3]

The function g is defined by g : $x \mapsto 2x + k$ for $x \in \mathbb{R}$.

   (iv) Find the value of the constant k for which the equation gf$(x) = 0$ has two equal roots.   [4]