

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

(i) Express  $2x^2 - 12x + 7$  in the form  $2(x + a)^2 + b$ , where  $a$  and  $b$  are constants. [2]

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

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The function  $g$  is defined by  $g : x \mapsto 2x^2 - 12x + 7$  for  $x \leq k$ .

(iii) State the largest value of  $k$  for which  $g$  has an inverse. [1]

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(iv) Given that  $g$  has an inverse, find an expression for  $g^{-1}(x)$ . [3]

[illegible]