

9 The functions f and g are defined for all real values of x by

$$f(x) = 4x^2 - 12x \quad \text{and} \quad g(x) = ax + b,$$

where a and b are non-zero constants.

(i) Find the range of f .

(ii) Explain why the function f has no inverse.

(iii) Given that $g^{-1}(x) = g(x)$ for all values of x , show that $a = -1$.

(iv) Given further that $gf(x) < 5$ for all values of x , find the set of possible values of b .

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