Topic 4: Functions	Inverse of a function, Domain & Range of a function

Given the function $f(x) = \frac{5}{x-7} + 4$ for $2 \leq x \leq 8, x \neq 7$.

(a) Find the range of f. [3 marks]

(b) Find the value of $f^{-1}(-1)$.

Mark scheme:

(a) $f(2) = 3$ *and* $f(8) = 8$ (A1)

The range is $f(x) \leq 3, f(x) \geq 9$ A1 A1

**Note: Award at most A1 A1 A0 if strict inequalities are used.

[3 marks]

(b) Either:

Sketch of f and $y = -1$ or sketch of f^{-1} and $x = -1$ (M1)

or

finding the correct expression for $f^{-1}(x) = \frac{5}{x-4} + 7 = \frac{7x-23}{x-4}$ (M1)

or

$$f^{-1}(-1) = \frac{7(-1)-23}{-1-4}$$ (M1)

Or

$$f(x) = -1$$ (M1)

Then

$$f^{-1}(-1) = 6$$ (A1)

[2 marks]