**8** The functions f and g are defined by

$$f(x) = \frac{4}{x} - 2 \quad \text{for } x > 0,$$

$$g(x) = \frac{4}{5x + 2} \quad \text{for } x \geqslant 0.$$

**(i)** Find and simplify an expression for fg($x$) and state the range of fg. [3]

**(ii)** Find an expression for $g^{-1}(x)$ and find the domain of $g^{-1}$. [5]