13 The functions f and g are defined, for $x > 0$, by

$$\mathrm{f}(x) = \frac{2x^2 - 1}{3x},$$
$$\mathrm{g}(x) = \frac{1}{x}.$$

(a) Find and simplify an expression for $\mathrm{fg}(x)$. [2]

(b) **(i)** Given that f^{-1} exists, write down the range of f^{-1}. [1]

(ii) Show that $\mathrm{f}^{-1}(x) = \frac{px + \sqrt{qx^2 + r}}{4}$, where p, q and r are integers. [4]

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