10 The functions f and g are defined by

$$\mathrm{f} : x \mapsto 3x + 2, \qquad x \in \mathbb{R},$$
$$\mathrm{g} : x \mapsto \frac{6}{2x + 3}, \qquad x \in \mathbb{R}, \quad x \neq -1.5.$$

(i) Find the value of x for which $\mathrm{fg}(x) = 3$. [3]

(ii) Sketch, in a single diagram, the graphs of $y = \mathrm{f}(x)$ and $y = \mathrm{f}^{-1}(x)$, making clear the relationship between the two graphs. [3]

(iii) Express each of $\mathrm{f}^{-1}(x)$ and $\mathrm{g}^{-1}(x)$ in terms of x, and solve the equation $\mathrm{f}^{-1}(x) = \mathrm{g}^{-1}(x)$. [5]