| Question | Scheme | Marks | AOs |
|---|---|---|---|
| 4 (a) | Either attempts $\dfrac{3x-7}{x-2}=7 \Rightarrow x=...$ <br><br> Or attempts $f^{-1}(x)$ and substitutes in $x=7$ | M1 | 3.1a |
| | $\dfrac{7}{4}$ oe | A1 | 1.1b |
| | | **(2)** | |
| (b) | Attempts $ff(x)=\dfrac{3\times\left(\dfrac{3x-7}{x-2}\right)-7}{\left(\dfrac{3x-7}{x-2}\right)-2}=\dfrac{3\times(3x-7)-7(x-2)}{3x-7-2(x-2)}$ | M1, dM1 | 1.1b 1.1b |
| | $=\dfrac{2x-7}{x-3}$ | A1 | 2.1 |
| | | **(3)** | |
| | | **(5 marks)** | |
| **Notes:** | | | |

**(a)**

**M1:** For either attempting to solve $\dfrac{3x-7}{x-2}=7$. Look for an attempt to multiply by the $(x-2)$

leading to a value for $x$.

Or score for substituting in $x=7$ in $f^{-1}(x)$. FYI $f^{-1}(x)=\dfrac{2x-7}{x-3}$

The method for finding $f^{-1}(x)$ should be sound, but you can condone slips.

**A1:** $\dfrac{7}{4}$

**(b)**

**M1:** For an attempt at fully substituting $\dfrac{3x-7}{x-2}$ into $f(x)$. Condone slips but the expression must

have a correct form. E.g. $\dfrac{3\times\left(\dfrac{*-*}{*-*}\right)-a}{\left(\dfrac{*-*}{*-*}\right)-b}$ where $a$ and $b$ are positive constants.

**dM1:** Attempts to multiply **all** terms on the numerator and denominator by $(x-2)$ to create a fraction $\dfrac{P(x)}{Q(x)}$

where both $P(x)$ and $Q(x)$ are linear expressions. Condone $\dfrac{P(x)}{Q(x)}\times\dfrac{x-2}{x-2}$

**A1:** Reaches $\dfrac{2x-7}{x-3}$ via careful and accurate work. Implied by $a=2, b=-7$ following correct work.

......................................................................................................................................

Methods involving $\dfrac{3x-7}{x-2}\equiv a+\dfrac{b}{x-2}$ may be seen. The scheme can be applied in a similar way

FYI $\dfrac{3x-7}{x-2}\equiv 3-\dfrac{1}{x-2}$