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Unusual Functions Equation | Past Paper Question | C3 Edexcel June 2013 Q7(d)

The function f has domain $-2 \leq x \leq 6$ and is linear from $(-2, 10)$ to $(2, 0)$ and from $(2, 0)$ to $(6, 4)$. A sketch of the graph of $y = f(x)$ is shown

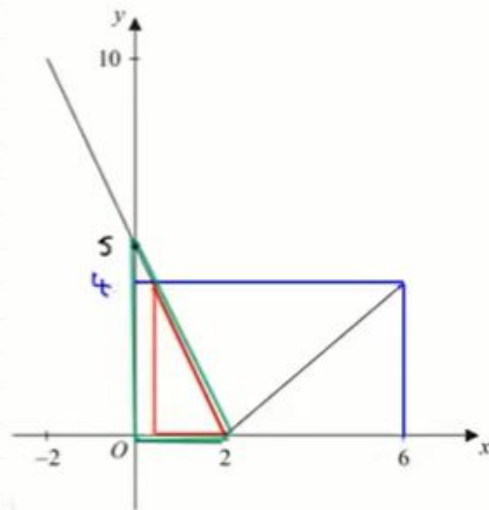
The function g is defined by

$$g : x \rightarrow \frac{4 + 3x}{5 - x}, \quad x \in \mathbb{R}, \quad x \neq 5$$

(c) Find $g^{-1}(x)$ (3) $g^{-1}(x) = \frac{5x - 4}{3 + x}$

(d) Solve the equation $gf(x) = 16$ (5)

$$\begin{aligned} g^{-1}gf(x) &= g^{-1}(16) && \therefore x = 6 \\ \therefore f(x) &= g^{-1}(16) && \text{or} \\ &= \frac{5(16) - 4}{3 + 16} && x = \frac{1}{5}(2) = \frac{2}{5} \\ \therefore f(x) &= 4 && \therefore x = 6 \text{ or } x = \frac{2}{5} \end{aligned}$$



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