

8

$$f : x \mapsto 2x^2 + 3,$$

$$g : x \mapsto 3x + 2.$$

(i) Show that $gf(x) = 6x^2 + 11$ and obtain an unsimplified expression for $fg(x)$. [2]

This image shows a full page of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting practice. There are no margins, text, or other markings on the page.

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

[illegible]

[illegible]

(iii) Solve the equation $gf(2x) = fg(x)$.

[3]

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