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(a) Show that the equation $\log_4(2x+1) = 2\log_4(3x-1) - 2$ can be written as a quadratic equation in x . [3]

This image shows a full page of white paper with horizontal dashed lines, typical of primary school handwriting practice paper. The lines are evenly spaced and run across the entire width of the page. There are no margins, text, or other markings present.

- (b)

Hence solve the equation $\log_4(2x+1) = 2\log_4(3x-1) - 2$. [2]

[illegible]

3 (a) Express $3\sqrt{2}\sin(x+45^\circ) + \cos x$ in the form $R\cos(x-\alpha)$, where $R > 0$ and $0^\circ < \alpha < 90^\circ$. [4]

Blank lined paper for writing.

(b) Hence solve the equation $3\sqrt{2}\sin(3\theta+45^\circ)+\cos 3\theta=-4$ for $0^\circ < \theta < 180^\circ$. [4]

Handwriting practice lines (dotted lines) for the number 4.

Find the x -coordinate of M .

[5]

[illegible]

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 or typing. There are no margins, text, or other markings on the page.

10 Let $f(x) = \frac{x^2 + 2x + 11}{(3+x)(2+x^2)}$.

(a) Express $f(x)$ in partial fractions.

[6]

This image shows a full page of primary-ruled paper. It features multiple sets of horizontal dashed lines spaced evenly down the page, providing a guide for handwriting practice. The paper is otherwise blank, with no margins or additional markings.

(b) Hence obtain the expansion of $f(x)$ in ascending powers of x , up to and including the term in x^2 .
[5]

[illegible]