DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN

4 The polynomial p is given by $\mathrm{p}(x) = a^2x^3 + 2ax^2 + ax + 2$, where a is a positive integer. It is given that $2x + 1$ is a factor of $\mathrm{p}(x)$.

(a) Find the value of a. [3]

(b) Hence factorise $\mathrm{p}(x)$. [2]

(c) Hence show that the equation $\mathrm{p}(x) = 0$ has only one real root. [1]

5 **(a)** Write $2x^2 - 2x + 3$ in the form $a(x+b)^2 + c$, where a, b and c are constants. [3]

It is given that $\mathrm{f}(x) = 2x^2 - 2x + 3$, for $x \leqslant p$.

(b) Write down the greatest value of p for which f has an inverse. [1]

(c) Using this value of p, write down the range of f. [1]

(d) Using this value of p, find an expression for f^{-1}. [3]

DO NOT WRITE IN THIS MARGIN