3 **(a)** Determine whether the equation $\frac{(4x+1)(3x+2)}{5x-3} = x+1$ has two distinct real roots, two equal roots or no real roots. [4]

(b) Solve the equation $\frac{12}{\sqrt[3]{x}} - \sqrt[3]{x} = 4$. [4]

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4 The polynomial p is such that $\mathrm{p}(x) = 6x^3 + x^2 - 12x + 5$.

(a) Find the remainder when $\mathrm{p}(x)$ is divided by $x - 2$. [1]

(b) (i) Show that $2x - 1$ is a factor of $\mathrm{p}(x)$. [1]

(ii) Hence write $\mathrm{p}(x)$ as a product of linear factors. [3]

(iii) Hence solve the equation $6\sin^3\theta + \sin^2\theta - 12\sin\theta + 5 = 0$ for $0° \leqslant \theta \leqslant 90°$. [2]

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