5 The polynomial $\mathrm{p}(x)$ is defined by

$$\mathrm{p}(x) = ax^4 + bx^3 + 13x^2 - 35x + 15,$$

where a and b are constants. It is given that $(2x-1)$ and $(x-3)$ are factors of $\mathrm{p}(x)$.

(a) Find the values of a and b. [4]

(b) Hence factorise $\mathrm{p}(x)$. [3]

(c) Find the least positive value of θ in radians such that $\mathrm{p}(\cot 2\theta) = 0$. [2]