5 A curve has equation $y = 5e^{2x-1} + e$. The tangent to the curve at the point where $x = 1$ cuts the x-axis at the point P.

Find the equation of the tangent in the form $y = mx + c$, where m and c are exact values, and hence find the x-coordinate of P. [6]

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6 **(a)** Show that $\sin^3 x\left(\frac{\operatorname{cosec} x}{\cot x}\right)$ can be written as $\sin^2 x \tan x$. [3]

(b) Solve the equation $\cos^2 x \tan x - \frac{1}{2}\tan x = 0$ for $-\pi < x < \pi$. [5]

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