10 **(a)** Solve the equation $\sin\alpha\,\text{cosec}^2\alpha + \cos\alpha\sec^2\alpha = 0$ for $-\pi < \alpha < \pi$, where α is in radians. [4]

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(b) (i) Show that $\frac{\cos\theta}{1-\sin\theta}+\frac{1-\sin\theta}{\cos\theta}=2\sec\theta$. [4]

(ii) Hence solve the equation $\frac{\cos 3\phi}{1-\sin 3\phi}+\frac{1-\sin 3\phi}{\cos 3\phi}=4$ for $0° \leqslant \phi \leqslant 180°$. [4]

Question 11 is printed on the next page.

11 The normal to the curve $y = \dfrac{\ln\left(x^2+2\right)}{2x-3}$ at the point where $x = 2$ meets the y-axis at the point P.

Find the coordinates of P. [7]

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