**3** A curve has equation $y = \dfrac{2 + \sin 3x}{x + 1}$.

**(a)** Show that the exact value of $\dfrac{\mathrm{d}y}{\mathrm{d}x}$ at the point where $x = \dfrac{\pi}{6}$ can be written as $\dfrac{k}{\left(\dfrac{\pi}{6} + 1\right)^2}$, where $k$ is an integer. [5]

**(b)** Find the equation of the normal to the curve at the point where $x = 0$. [4]

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**4** Find rational values $a$ and $b$ such that $\frac{a}{\sqrt{5}+2}+\frac{b}{\sqrt{5}-2}=1$. [5]