9 **(a)** Given that $\int_1^a \left(\frac{1}{x} - \frac{1}{2x+3}\right) \mathrm{d}x = \ln 3$, where $a > 0$, find the exact value of a, giving your answer in simplest surd form. [6]

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(b) Find the exact value of $\int_0^{\frac{\pi}{3}} \left(\sin\left(2x + \frac{\pi}{3}\right) - 1 + \cos 2x \right) \mathrm{d}x$. [5]