9 **(a)** Solve the equation $3\,\text{cosec}^2\left(2\phi - \frac{\pi}{3}\right) = 4$, for $0 < \phi < \pi$. Give your solutions in terms of π. [4]

(b) Given that $2x - 1 = \text{cosec}^2\theta$ and $y + 1 = \tan^2\theta$, find y in terms of x. [4]

10 **(a)** Show that $\frac{6}{2+3x}+\frac{4}{(x+1)^2}-\frac{2}{x+1}$ can be written as $\frac{14x+10}{(2+3x)(x+1)^2}$. [2]

(b) Hence find the exact value of $\int_0^2 \frac{14x+10}{(2+3x)(x+1)^2}\,\mathrm{d}x$. Give your answer in the form $p+\ln q$, where p and q are rational numbers. [6]

© UCLES 2022