10 **(a)** Solve $\tan(\alpha + 45°) = -\frac{1}{\sqrt{2}}$ for $0° \leqslant \alpha \leqslant 360°$. [3]

(b) **(i)** Show that $\frac{1}{\sin\theta - 1} - \frac{1}{\sin\theta + 1} = a\sec^2\theta$, where a is a constant to be found. [3]

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(ii) Hence solve $\frac{1}{\sin 3\phi - 1} - \frac{1}{\sin 3\phi + 1} = -8$ for $-\frac{\pi}{3} \leqslant \phi \leqslant \frac{\pi}{3}$ radians. [5]

Question 11 is on the next page.

11 Given that $\int_1^a \left(\frac{2}{2x+3} + \frac{3}{3x-1} - \frac{1}{x}\right) \mathrm{d}x = \ln 2.4$ and that $a > 1$, find the value of a. [7]

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