12 **(a)** **(i)** Given that $f(x) = \frac{1}{\cos x}$, show that $f'(x) = \tan x \sec x$. [3]

(ii) Hence find $\int \left(3 \tan x \sec x - \sqrt[4]{e^{3x}}\right) dx$. [3]

(b) Given that $\int_2^5 \frac{p}{px+10}\mathrm{d}x = \ln 2$, find the value of the positive constant p. [5]

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