12 Trigonometric functions: $\sec^2(ax + b)$

1. (a) Find $\dfrac{d}{dx} \tan x$ [2]

   (b) Hence find $\int \sec^2 x \cdot dx$

2. (a) What is the pythagorean identity between $\tan^2 x$ and $\sec^2 x$? [3]

   (b) Find $\int \tan x (\tan x + \frac{\cos x}{\sin x}) \cdot dx$