1. Find the following indefinite integrals, in terms of x, simplifying your answers as far as possible:

    (a) $\displaystyle\int 9x^5 (3x^6 - 7)^4 \, dx$ using $u = 3x^6 - 7$

    (b) $\displaystyle\int x^2 e^{4x^3} \, dx$ using $u = 4x^3$

    (c) $\displaystyle\int \sin^3 x \cos x \, dx$ using $u = \sin x$

    (d) $\displaystyle\int \frac{\sec^2 x \, dx}{\tan x}$

2. Evaluate:

    (a) $\displaystyle\int_0^1 \frac{12x}{(2x^2 + 1)^4} \, dx$ using $u = 2x^2 + 1$

    (b) $\displaystyle\int_0^{\frac{\pi}{2}} \sin x \cos^3 x \, dx$