

1. Compute the following integrals using u -substitution.

(a) $\int \sin(\tan x) \sec^2(x) dx$

(b) $\int \frac{(\ln x)^3}{x} dx$

(c) $\int \frac{x^{-\frac{2}{3}} e^{\sqrt{x^{1/3}+3}}}{\sqrt{x^{1/3}+3}} dx$

2. Compute $\int_{-2}^3 |(x+1)(x-2)(x-3)| dx$.

3. Give an example of functions f and g with $\int_0^1 f(x) - g(x) dx = 0$ but $\int_0^1 |f(x) - g(x)| dx > 0$. Explain why this is possible.