Spring 2021 MATH 76
Activity 0

1. Consider the following integrals. Write out the expression you will use as u in a $u-$substitution. Indicate also du. Then complete the $u-$substitution.

   (a) $\int \sin^3 x \cos x dx$ $\quad u = \ldots\ldots\ldots\ldots\ldots$ $\quad du = \ldots\ldots\ldots\ldots\ldots$

   (b) $\int \frac{2x^2}{\sqrt{1-4x^3}} dx$ $\quad u = \ldots\ldots\ldots\ldots\ldots$ $\quad du = \ldots\ldots\ldots\ldots\ldots$

   (c) $\int \frac{e^x - e^{-x}}{e^x + e^{-x}} dx$ $\quad u = \ldots\ldots\ldots\ldots\ldots$ $\quad du = \ldots\ldots\ldots\ldots\ldots$

2. Evaluate the following integrals

(a) $\int \frac{\sin x}{\cos x} dx$

(b) $\int x^2 e^{x^3+1} dx$

(c) $\int \frac{\ln x}{x} dx$

(d) $\int_0^1 2x(4 - x^2) dx$

(e) $\int_0^2 \frac{2x}{(x^2+1)^2} dx$

(f) $\int_0^{\pi/2} \sin^2\theta \cos\theta d\theta$

(g) $\int_0^2 x^3\sqrt{16-x^4} dx$

(h) $\int_2^3 \frac{x}{\sqrt[3]{x^2-1}} dx$