

Show all your work. Due April 25th, 2017.

Name:**Student ID:****1. (More Indefinite Integrals)**Find each indefinite integral. (check by differentiation.) A) $\int \frac{e^x - 3x}{4} dx$

B) $\int \frac{du}{\sqrt{u}}$

C) $\int \frac{1-3x^4}{x^2} dx$

D) $\int \frac{6dm}{m^2}$

2. (Initial Differential Equations)

Find the particular antiderivative of each derivative that satisfies the given condition:

A) $C'(x) = 6x^2 - 4x; \quad C(0) = 3000$

B) $\frac{dx}{dt} = 4e^t - 2; \quad x(0) = 1$

3. **(Integral by Substitution)** Use a substitution to find each indefinite integral:

A) $\int (2x^3 - 3)^4 (6x^2) dx$

B) $\int \frac{x}{x^2-9} dx$

C) $\int 5t^2 (t^3 + 4)^{-2} dt$

D) $\int x\sqrt{x+1} dx$

E) $\int e^{1-x} dx$

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

4. **(Riemann Sum)** Calculate the indicated Riemann sum S_n for the function $f(x) = x^2$ when the partition and sample points are specified as follows:

A) Partition $[0, 3]$ into three subintervals of equal length, and let the sample points be $c_1 = 0.7$, $c_2 = 1.8$, and $c_3 = 2.4$.

B) Partition $[0, 3]$ into three subintervals of equal length, and let the sample points be the right endpoint of each subinterval, in other words, for k -th subinterval $[x_{k-1}, x_k]$, choose the sample point $c_k = x_k$.