

Ms. Nguyen Calculus 101A  
Sample Test Chapter 4

Find the indefinite integral in Problems 1-12.

1.  $\int (4x^3 + 2x^5 - 2x + 1) dx$

2.  $\int (2 \sin x + \cos x + e^x) dx$

3.  $\int (7 - x)^4 dx$

4.  $\int \frac{x^2 + 2x}{x^3 + 3x^2 - 4} dx$

5.  $\int \frac{2x}{(1 - 2x^2)^2} dx$

6.  $\int e^{3x-7} dx$

7.  $\int \frac{\cos(\ln x)}{x} dx$

8.  $\int \frac{x^2 - 7}{x - 2} dx$

9.  $\int \frac{\sin(3x)}{e^{\cos(3x)}} dx$

10.  $\int \frac{e^{2x}}{\sqrt{e^x + 1}} dx$

11.  $\int x^2 (x^3 + 1)^2 ((x^3 + 1)^3 + 1)^3 dx$

12.  $\int \frac{1}{(3x - 5)^2} dx$

13. Let  $S_n = \sum_{k=1}^n \left( 1 + \frac{2k}{n} \right) \left( \frac{2}{n} \right)$ . Find the limit of  $S_n$  as  $n \rightarrow \infty$ .

**Evaluate the definite integrals.**

14.  $\int_1^2 \frac{x^3 + 1}{x^2} dx$

15.  $\int_0^{\sqrt{\pi}} x \cos x^2 dx$

16. Evaluate:  $\frac{d}{dx} \int_2^{x^3} (3t^2 + 4)^2 dt$

17. Find the average value of  $f(x) = \sin x$  on the interval  $\left[ \frac{\pi}{4}, \frac{\pi}{2} \right]$ .

18. Find the area of the region lying between the graph of  $f(x) = |2x - 1|$ , the x-axis and the lines  $x = -2$ ,  $x = 2$ .