

Math 21B  
Kouba  
Discussion Sheet 0

1.) Differentiate the following functions.

- a.)  $y = 20x^5$    b.)  $f(x) = \sin 7x$    c.)  $g(x) = \tan \sqrt{x}$   
d.)  $g(x) = \sec(x^4)$    e.)  $f(x) = 3^{4x+7}$    f.)  $y = \ln(x - e^x)$   
g.)  $y = e^{x^2-2x}$    h.)  $f(x) = 2^{\tan(\ln x)}$    i.)  $f(x) = x^2 e^x$   
j.)  $f(x) = \ln |\sec x + \tan x|$

2.) Use your answers in problem 1.) to compute the following indefinite integrals.

- a.)  $\int 100x^4 dx$    b.)  $\int 7 \cos 7x dx$    c.)  $\int \frac{\sec^2 \sqrt{x}}{\sqrt{x}} dx$   
d.)  $\int x^3 \sec(x^4) \tan(x^4) dx$    e.)  $\int 3^{4x+7} \ln 3 dx$    f.)  $\int \frac{1 - e^x}{x - e^x} dx$   
g.)  $\int (x - 1)e^{x^2-2x} dx$    h.)  $\int \frac{2^{\tan(\ln x)} \sec^2(\ln x)}{x} dx$    i.)  $\int (x^2 + 2x)e^x dx$   
j.)  $\int \sec x dx$

3.) Compute the following indefinite integrals.

- a.)  $\int (4x^3 - x^{-2}) dx$    b.)  $\int \sin 3x dx$    c.)  $\int x \sec^2(x^2) dx$   
d.)  $\int (7^x + x^7) dx$    e.)  $\int (e^{4x} + 4e^x) dx$    f.)  $\int x(x - 1)^2 dx$    g.)  $\int \frac{1}{x} dx$   
h.)  $\int \frac{2x}{x^2 + 1} dx$    i.)  $\int \frac{\cos 3x}{1 + \sin 3x} dx$    j.)  $\int \frac{x + e^{2x}}{x^2 + e^{2x}} dx$

THE FOLLOWING PROBLEM IS FOR RECREATIONAL PURPOSES ONLY.

4.) Write a formula for the nth term in the following sequence : 2, 0, 0, 2, 6, 12, 20, 30, ...