Math 21B
Vogler
Worksheet 3

1.) Determine the following indefinite integrals (antiderivatives).

a.) $\int x(x^2+1)^5\,dx$ b.) $\int e^x \cos(e^x)\,dx$ c.) $\int cosxe^{2+\sin x}\,dx$

d.) $\int \frac{x^2+1}{x^3}\,dx$ e.) $\int \frac{x^2+1}{x+3}\,dx$ f.) $\int \frac{x^2}{x^3+1}\,dx$ g.) $\int 7^{3x+5}\,dx$

h.) $\int \frac{1}{\sqrt{1-x^2}}\,dx$ i.) $\int \frac{e^x}{\sqrt{1-(e^x)^2}}\,dx$ j.) $\int \frac{e^x}{1+e^x}\,dx$ k.) $\int \frac{1}{1+e^x}\,dx$

l.) $\int \frac{x}{\sqrt{1-x^2}}\,dx$ m.) $\int \cos^2 x\,dx$ n.) $\int \cot x\,dx$ o.) $\int \cot^2 x\ \csc^2 x\,dx$

p.) $\int \frac{x^2+5x+6}{x^2}\,dx$ q.) $\int \frac{x^2+5x+6}{x+1}\,dx$ r.) $\int (x^2+1)(x^3+3x)^{10}\,dx$

s.) $\int \frac{x+6}{(x+5)^2}\,dx$ t.) $\int \frac{(\ln x)^4}{x}\,dx$ u.) $\int \sec^2(3x)\ 2^{\tan(3x)}\,dx$

2.) Evaluate the following definite integrals.

a.) $\int_0^{\pi/2} \sin(x/2)\,dx$ b.) $\int_{-1}^{1} \frac{x}{x^2+1}\,dx$ c.) $\int_e^{e^2} \frac{1}{x(\ln x)}\,dx$

3.) Find the area of the region bounded by the graphs of the given equations.

a.) $y = x, y = 2x$, and $x = 2$ b.) $y = e^x, x = 0$, and $y = 2$
c.) $x = y^2$ and $x = 9$ d.) $y = x - 2$ and $y = x^3 - 2x^2$

4.) If $\int_{-2}^{1} f(x)\,dx = 3$ and $\int_{-2}^{3} f(x)\,dx = -2$. What is the value of $\int_3^1 f(x)\,dx$?

5.) Assume that f is an odd function and $\int_{-2}^{1} f(x)\,dx = 3$. What is the value of $\int_{-1}^{-2} f(x)\,dx$?

THE FOLLOWING PROBLEM IS FOR RECREATIONAL PURPOSES ONLY.

6.) Connect 6 toothpicks end-to-end to form 4 triangles.

Thanks to Dr. Kouba