Math 1001 Section 1 (Margo) Assignment #8 Due Nov 6

1. Integrate using either integration by parts or trigonometric formulas.

   (a) $\int x \sec^2 x \, dx$ (b) $\int_2^4 \frac{\ln x}{x^2} \, dx$ (c) $\int \ln(x^2+4) \, dx$

   (d) $\int \tan^{-1} \frac{x}{4} \, dx$ (e) $\int \cos x \, \ln(\sin x) \, dx$ (f) $\int x^2 \cos 3x dx$

   (g) $\int x^2 \tan^{-1} x \, dx$ (h) $\int e^{2x} \sin 3x \, dx$ (i) $\int \sin(\ln x) \, dx$

   (j) $\int \cos^3 \frac{x}{3} \, dx$ (k) $\int \sin^5 x \, dx$ (l) $\int \frac{\cos^3 x}{\sin^2 x} \, dx$

   (m) $\int \sin^3 2x \, \cos^4 2x \, dx$ (n) $\int \sin^4 2x \, dx$ (o) $\int_0^{\frac{\pi}{6}} \tan^4 2x \, dx$

   (q) $\int \tan^4 \frac{x}{2} \sec^4 \frac{x}{2} \, dx$ (r) $\int \tan^3 t \sec^5 t \, dt$

2. Evaluate $\int \frac{x}{\sqrt{3x+4}} \, dx$ by two methods and compare the answers:

   (a) by parts,

   (b) by substitution.

3. Find the volume of a solid obtained by the revolution around the x-axes of the region bounded by curves $y = cosx$, $y = 0$, $x = 0$.

4. a)Show using integration by parts that

$$\int \cos^n x \, dx = \frac{1}{n} \cos^{n-1} x \sin x + \frac{n-1}{n} \int \cos^{n-2} x \, dx$$

   b) Use (a) to evaluate $\int \cos^5 x \, dx$.