Math 1001 Section 1 (Margo) Assignment #3 Due Oct 2

1. Evaluate using an appropriate substitution

   (a) $\int \frac{x^3}{\sqrt{4-x^4}}\,dx$ (b) $\int_3^4 x\sqrt{25-x^2}\,dx$ (c) $\int_0^1 \frac{2x^2}{(x^3+1)^4}\,dx$

   (d) $\int \frac{e^{\frac{4}{x}}}{x^2}\,dx$ (e) $\int \frac{1}{x\ln^3 x}\,dx$ (f) $\int_1^9 \frac{1}{\sqrt{x}\,(1+\sqrt{x}\,)^2}\,dx$

   (g) $\int_1^{e^2} \frac{(1+2\ln x)^3}{x}\,dx$ (h) $\int \sqrt{x}\,(1+x\sqrt{x}\,)^5\,dx$ (i) $\int_0^{\frac{\pi}{12}} \frac{\sin 4x}{\cos^5 4x}\,dx$

   (j) $\int \sin^3 2x\,\cos 2x\,dx$ (k) $\int_0^{\frac{\pi}{3}} \sec^2 x\tan^4 x\,dx$ (l) $\int \frac{6\sin 2x}{(1-\cos 2x)^3}\,dx$

   (m) $\int \frac{e^{2x}}{9+4e^{2x}}\,dx$ (n) $\int_0^{\pi} \sin x\sqrt{5-4\cos x}\,dx$ (o) $\int \frac{\sec^2(\frac{1}{x^2})}{x^3}\,dx$

   (p) $\int \frac{2^x}{\sqrt{1+2^x}}\,dx$

2. Find a function $f(x)$ such that $f'(x) = \frac{x-1}{\sqrt{x^2-2x+9}}$ and $f(0) = 4$.

3. Evaluate the integral

   (a) $\int(4x+1)\sqrt{2x-1}\,dx$ (b) $\int \frac{x^2}{\sqrt{x+3}}\,dx$

4. Find the area under the curve $y = \frac{x}{2x^2+1}$ over the segment $[1, 2]$.