Math 113-008, Exam 2
12-15 October 2007
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Name _____
Row _____

1. (80%) Evaluate the following integrals.

(a) $\displaystyle\int \frac{x^3 + x + 1}{x^2 + 1}\, dx$

Answer: _____

(b) $\displaystyle\int \sin 4x \cos 5x\, dx$

Answer: _____

(c) $\displaystyle\int_0^{\pi/3} \tan^3 x \sec x\, dx$

Answer: _____

(d) $\displaystyle\int_0^2 x^2 \sqrt{4 - x^2}\, dx$

Answer: _____

(e) $\displaystyle\int_{-1}^3 t\sqrt{3 + 2t - t^2}\, dt$

Answer: _____

(f) $\displaystyle\int \frac{2w-1}{w(w-1)^2}\,dw$

Answer: _____

(g) $\displaystyle\int_0^{\infty} \frac{\arctan x}{1+x^2}\,dx$

Answer: _____

(h) $\displaystyle\int \sec^3 2t\,dt$

Answer: _____

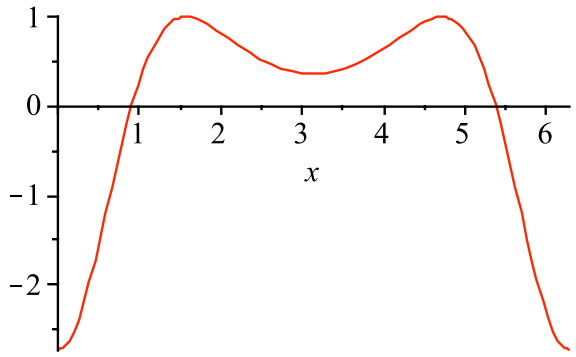
2. (8%) Circle the integrals that converge and put an X through the integrals that diverge. You do not need to show your work.

(a) $\displaystyle\int_1^{\infty} \frac{dx}{\sqrt{x}}$ (b) $\displaystyle\int_0^{1} \frac{dx}{\sqrt[3]{x}}$ (c) $\displaystyle\int_0^{\infty} \frac{x}{x^4+1}\,dx$ (d) $\displaystyle\int_0^{1} \frac{e^x\,dx}{x^2}$

3. (6%) A table for the function f is given. Use the table and Simpson's Rule to estimate $\int_1^3 f(x)\,dx$.

x	1.0	1.5	2.0	2.5	3.0
$f(x)$	2.0	2.3	2.5	2.7	3.0

4. (6%) The error bound for the Midpoint Rule approximation M_n of $\int_a^b f(x)\,dx$ is given by $|E_M| \leq \frac{K(b-a)^3}{24n^2}$ where $|f''(x)| \leq K$. The graph for $f''(x)$ is given below for $0 \leq x \leq 2\pi$. Is the error for the approximation M_{100} of $\int_0^{2\pi} f(x)\,dx$ less than 0.005? Justify your conclusion.



5. (bonus) Evaluate: $\int \sqrt{\frac{1+x}{1-x}}\,dx$

Answer: _____