Exam I Review

Sun Feb 21 21:55:46 PST 2010 Version 1

Please know the following for the exam Thursday, April 16.

1. The exam covers chapters 7 through 9.
2. Be able to do all problems from the quizes and homework.
3. Derivatives
   a. Know the chain rule, product rule and quotient rule.
   b. Know the derivative of e^x, $\ln x$, $\sin x$, $\cos x$, $\tan x$, $\arcsin x$, $\arccos x$, $\arctan x$, $\sinh x$, $\cosh h$, $\tanh x$, $\sinh^{-1} x$, $\cosh^{-1} x$ and $\tanh^{-1} x$.
4. Integrals
   a. Know integration techniques of u substitution.
   b. Know $\int e^x\,dx$, $\int \ln x\,dx$, $\int \sin x\,dx$, $\int \cos x\,dx$, $\int \sinh x$, $\int \cosh x$, $\int \frac{1}{x}dx$, $\int \frac{1}{1+x^2}dx$, $\int \frac{1}{1-x^2}dx$, $\int \frac{1}{\sqrt{x^2-1}}dx$, $\int \frac{1}{\sqrt{1-x^2}}dx$ and $\int \frac{1}{\sqrt{x^2+1}}dx$.
5. Be able to find the area between two curves.
6. Be able to volumes of revolution using the disk and shell methods.
7. Be able to find arc lengths and surface areas of revolutions.
8. Know implicit differentiation and how to find the derivative of an inverse function.
9. Be able to compute limits involving exponentials and logarithms.
10. Sample problems
    a. $\lim_{n\to\infty} \left(1+\frac{3}{n}\right)^n \qquad \lim_{x\to 0} n^2 \ln\left(1+\frac{4}{n^2}\right)$
    b. $\frac{d}{dx}\ln(3+\cosh x)$
    c. $\frac{d}{dx}\ln\big((x+1)(x+2)(x+3)(x+4)(x+5)\big)$
    d. $\int_0^1 \sqrt{4-x^2}\,dx \qquad \int_4^6 \sqrt{x^2-4}\,dx \qquad \int_0^2 xe^{-x^2}dx$
    e. page 254# 2, 19c, 34, 45, 54, 55
    f. page 288# 11, 14a, 24i, 25o
    g. page 330# 7, 25, 34, 86, 104