6/22/2001

Calculus Makeup Exam (§7.2∼8.9)

1. Evaluate the integral $\int \frac{9}{(x+2)^2(1-x)}dx$.
2. Evaluate the integral: $\int_0^{\sqrt{3}/2} \frac{t^2}{(1-t^2)^{3/2}}dt$.
3. Evaluate the limit using L'Hôpital's Rule: $\lim_{x\to\infty}(1+\frac{2}{x})^x$
4. Evaluate the integral $\int \cos(\ln x)dx$.
5. Evaluate $\int \sin^2 x \cos^3 x dx$.
6. Determine whether the series, $\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{\ln(n+1)}$ is convergent or divergent. If convergent, classify the series as absolutely convergent or conditionally convergent.
7. Investigate $\sum_{n=1}^{\infty}(\frac{n+1}{n})^n$ for convergence or divergence.
8. Find the third degree Taylor polynomial centered at 0 for the function $f(x) = e^{2x} + 3x$.
9. Find a power series, centered at 1, for the function $f(x) = \frac{2}{4x+3}$ and determine the interval of convergence.
10. Approximate $\int_0^{0.3} \sin x^2 dx$ using a power series.