MATH 1352-008 Exam III-B April 16, 2008
Make-up

Answer the problems on separate paper. You do not need to rewrite the problem statements on your answer sheets. Work carefully. Do your own work. **Show all relevant supporting steps!** Attach this sheet to the front of your solution pages.

Bald solutions to problems – answers without accompanying, supporting work – will receive ***no*** credit.

1. (16 pts) Choose two of the following. Compute the limit of the sequence, if it exists. Show all supporting work.

a. $\left\{\dfrac{2n^3+5n^2}{6-3n^2}\right\}$ b. $\left\{\dfrac{\ln\left(n^2\right)}{4n}\right\}$ c. $\left\{\dfrac{n^2+10n+1}{n^{5/2}+n^2}\right\}$

2. (8 pts) Choose one. Find the sum of the series, if it exists. Show all supporting work.

a. $\displaystyle\sum_{k=1}^{\infty}\frac{3}{10}\left(\frac{-5}{3}\right)^k$ b. $\displaystyle\sum_{k=2}^{\infty}\frac{7}{2}\left(\frac{5}{8}\right)^k$

3. (12 pts) Choose one. Determine whether the series converges or diverges. Show all supporting work.

a. $\displaystyle\sum_{k=2}^{\infty}\frac{\sqrt{k}}{k^3+k}$ b. $\displaystyle\sum_{k=1}^{\infty}\frac{2k}{\sqrt{k^3+k}}$

4. (12 pts) Choose one. Determine whether the series converges or diverges. Show all supporting work.

a. $\displaystyle\sum_{k=1}^{\infty}\frac{k2^{k+2}}{k!}$ b. $\displaystyle\sum_{k=1}^{\infty}\frac{2^k}{k^2+2k}$

5. (12 pts) Choose one. Determine whether the series converges absolutely, converges conditionally or diverges. Show all supporting work.

a. $\displaystyle\sum_{k=1}^{\infty}\frac{(-1)^{k+1}}{2k^2+1}$ b. $\displaystyle\sum_{k=1}^{\infty}\frac{(-1)^{k+1}2k}{(k+4)^2}$

7. (16 pts) Choose one. Find the convergence set for the power series. Show all supporting work.

a. $\displaystyle\sum_{k=1}^{\infty}\frac{2^k x^k}{k^2}$ b. $\displaystyle\sum_{k=2}^{\infty}\frac{x^k}{2^k}$

7. (12 pts) Choose one. Determine how many terms of the series are necessary to estimate its sum to four-place accuracy. Using those terms, estimate the sum of the series. Show all supporting work.

a. $\displaystyle\sum_{k=1}^{\infty}(-1)^{k+1}\frac{8k+20}{10^{k+1}}$ b. $\displaystyle\sum_{k=1}^{\infty}(-1)^k\frac{k^2+k}{10^{k+1}}$

8. (12 pts) Choose one. Show all supporting work.

a. Find the first 4 non-zero terms in Taylor's expansion of $f(x)=\cos\dfrac{\pi}{2}x$ at $c = 1$.

b. Find the MacLaurin series expansion for $f(x)=\dfrac{e^{x^2}-e^{-x^2}}{2x^2}$