MA 162 **Exam 3 Review Problems** **Fall 2009**

P. 759: 1,3,5,6,11,12,13,14,15,18,19,20,23,24,27,35,40,42.

P. 733: 5,14,16,26,30.

Answers to even numbered problems

P. 759:

6. The sequence converges and the limit is 0.

12. Diverges by the Limit Comparison Test.

14. Converges by the Alternating Series Test.

18. Converges by the Root Test.

20. Diverges by the Ratio Test.

24. Absolutely convergent.

40. $R = 5$. The interval of convergence is $[-5, 5]$.

42. $R = \infty$. The interval of convergence is $(-\infty, \infty)$.

P. 733:

14. (a) $\ln(1+x) = \sum_{n=0}^{\infty} \frac{(-1)^n x^{n+1}}{n+1}$. (b) $x \ln(1+x) = \sum_{n=0}^{\infty} \frac{(-1)^n x^{n+2}}{n+1}$.

    (c) $\ln(1+x^2) = \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n+2}}{n+1}$.

16. $\sum_{n=0}^{\infty} 2^n (n+1) x^{n+2}$. $R = \frac{1}{2}$.

26. $\displaystyle\sum_{n=0}^{\infty}(-1)^n \frac{x^{4n+3}}{(2n+1)((4n+3)} + C. \quad R = 1.$

30. $\displaystyle\int_0^{0.3} \frac{x^2}{1+x^4}\,dx = \sum_{n=0}^{\infty}(-1)^n \frac{3^{4n+3}}{(2n+1)((4n+3)10^{4n+3}}.$

$\displaystyle\int_0^{0.3} \frac{x^2}{1+x^4}\,dx \approx \frac{3^3}{3\cdot 10^3} - \frac{3^7}{7\cdot 10^7}$, to 6 decimal places.