MATE 3032 assignment 9: sections 11.3, 11.4

73. Use a test to determine whether the series is convergent:

(a) $\sum_{n=1}^{\infty} n^{-3}$

(b) $\sum_{k=1}^{\infty} \frac{1}{k^2 + 3}$.

74. Exercise 1 p. 725.

75. Exercises 11–14 p.726.

76. Can the integral test be used to determine convergence of the series $\sum_{n=1}^{\infty} \frac{\cos(\pi n)}{\sqrt{n}}$?

77. Find the values of p for which the series $\sum_{n=1}^{\infty} n(1 + n^2)^p$ is convergent.

78. Exercises 1,2 p.731.

79. Determine whether the series converges or diverges:

(a) $\sum_{k=1}^{\infty} \frac{k - 1}{k\sqrt{k}}$

(b) $\sum_{k=1}^{\infty} \frac{1}{\sqrt[4]{1 + k^3}}$

(c) $\sum_{n=1}^{\infty} \frac{n^2 + n + 1}{n^4 + 2n}$

(d) $\sum_{n=1}^{\infty} \sin(1/n)$

(e) $\sum_{n=1}^{\infty} \frac{n \sin n}{1 + n^3}$.

80. Exercise 37 p.731. Use comparison.

81. Show that if $a_n > 0$ and na_n has a nonzero limit as $n \to \infty$, then $\sum a_n$ is divergent. Hint:

$$na_n = \frac{a_n}{1/n}.$$

Use the comparison test.