Weekly Assignment 7

1. Ratio test (and fall-backs)

a. For which of the following series does the ratio test gives an answer about the series's convergence? For these series, give that answer.

- $\sum\limits_{n=1}^{\infty} \dfrac{2}{n^3+1}$

- $\sum\limits_{n=1}^{\infty} \dfrac{1}{n\,3^n}$

- $\sum\limits_{n=1}^{\infty} \dfrac{(-2)^n}{n^{10}}$

- $\sum\limits_{n=1}^{\infty} \dfrac{n}{1+3\,n}$

b. For any of the series in the first part for which the ratio test was inconclusive, use another test to determine if the series converges or diverges.

2. Interval of convergence

For each power series, determine the interval of convergence. (Be sure to check endpoints, if there are any.)

a. $\sum\limits_{n=1}^{\infty} (-1)^{n+1}\, \dfrac{x^n}{2^{n-1}\,n}$

b. $\sum\limits_{n=0}^{\infty} (-1)^n\, \dfrac{(3\,x-7)^n}{n!}$