MATHEMATICS

Monday October 24 2016

Fifth Exercise Class

1) Evaluate the following limits

$$\lim_{n\to+\infty} \frac{n^5 - 6n + 7}{3n^4 + 5n^3}$$

$$\lim_{n\to+\infty} \frac{4n^3 - n^{\frac{7}{2}}}{1 - \sqrt{n}}$$

$$\lim_{n\to+\infty} \frac{3^n + n^4}{n^n + n!}$$

$$\lim_{n\to+\infty} (\sqrt{n+2} - \sqrt{n-1})$$

$$\lim_{n\to+\infty} \sqrt[3]{n+1} - \sqrt[3]{n}$$

$$\lim_{n\to+\infty} \left(1 + \frac{5}{n^2}\right)^{n^2}$$

$$\lim_{n\to+\infty} \left(\frac{n^2 + n + 1}{n^2 + 5}\right)^{3n}$$

$$\lim_{n\to+\infty} \frac{\log(n^3 + 1)}{\log(2n^5 - 8)}$$

$$\lim_{n\to+\infty} (\sqrt[n]{3} - 1)^n$$

$$\lim_{n\to+\infty} \frac{e^{\frac{1}{n}} - 1}{\ln(n+1) - \ln n}$$

$$\lim_{n\to+\infty} (\sqrt[n]{3} - 1)^n$$

$$\lim_{n\to+\infty} (n^{\sqrt{n} - 2^n})$$

2) For each of the following series determine convergence or divergence. In case of convergence calculate the sum.

$$\sum_{n=0}^{+\infty} \left(\frac{3}{4}\right)^n$$

$$\sum_{n=1}^{+\infty} (-1)^n e^{-n+1}$$

$$\sum_{n=0}^{+\infty} \frac{(-1)^n + 3^n}{5^n}$$

$$\sum_{n=0}^{+\infty} \frac{2^{4n}}{3^{2n}}$$

$$\sum_{n=0}^{+\infty} \frac{(-1)^n 3^{n+2}}{5^n}$$

$$\sum_{n=1}^{+\infty} \frac{2^{2n+1}}{3^2 n}$$

$$\sum_{n=0}^{+\infty} \frac{(-1)^n + 3^n}{5^n}$$

$$\sum_{n=0}^{+\infty} \frac{2^{4n}}{3^{2n}}$$