MA114 Summer 2018
Worksheet 12a – Series Testing Strategy – 7/02/18

1. For each series below, decide what test is most appropriate to use first to test the convergence or divergence of the series. You do not need to actually apply the test. (Although it would be good practice to do so sometime before our next exam.)

(a) $\displaystyle\sum_{n=1}^{\infty} \frac{n^2-1}{n^3+1}$ LCT w/ $\frac{1}{n}$, CT w $\frac{1}{2n}$ for $n \geq 2$

(b) $\displaystyle\sum_{k=0}^{\infty} \frac{5^k}{k!}$ Ratio

(c) $\displaystyle\sum_{n=1}^{\infty} \frac{n-1}{2n+1}$ Divergence Test

(d) $\displaystyle\sum_{m=2}^{\infty} \frac{\sqrt{m^3+1}}{3m^3+4m^2+2}$ LCT with $\frac{1}{m^{3/2}}$

(e) $\displaystyle\sum_{n=1}^{\infty} ne^{-n^2}$ Ratio / Integral / Root

(f) $\displaystyle\sum_{n=1}^{\infty} (-1)^{n+2}\frac{n^3}{n^4+1}$ AST

(g) $\displaystyle\sum_{n=1}^{\infty} \frac{1}{2+3^n}$ Comparison, Root, Ratio, LCT to $\frac{1}{3^n}$ to $\frac{1}{3^n}$

(h) $\displaystyle\sum_{i=1}^{\infty} (\sqrt[i]{2}-1)^i$ Root

(i) $\displaystyle\sum_{\alpha=1}^{\infty} \frac{e^{1/\alpha}}{\alpha^2}$ Integral (Root & Ratio inconclusive).

(j) $\displaystyle\sum_{n=1}^{\infty} (-1)^n\frac{n^4}{4^n}$ Ratio, AST, Root

(k) $\displaystyle\sum_{n=1}^{\infty} \frac{2^{n-1}e^{n+1}}{n^n}$ Root