

BC Calculus 9.5b Error Bounds

p. 637 37-45 odd

p. 637 40-46 even, 47-61 odd

37) $\sum_{n=0}^{\infty} \frac{(-1)^n}{n!}$ a) Determine # of terms, error < 0.001 b) Approximate sum of series

$|R_n| \leq a_{n+1} \quad \left| \frac{(-1)^n}{(n+1)!} \right| < 0.001 \quad N=6$

b) ≈ 0.368 (7 terms)

39) $\sum_{n=0}^{\infty} \frac{(-1)^n}{(2n+1)!}$ a) $N=2$ b) ≈ 0.842 (3 terms)

41) $\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{n}$ $\frac{1}{N+1} < 0.001 \quad N=1000$ b) ≈ 0.693

1000 terms

43) $\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{n^3}$ $|R_N| < a_{N+1} = \frac{1}{(N+1)^3} < 0.001 \quad (N+1)^3 > 1000 \quad N+1 > 10$

10 terms

45) $\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{2n^3-1}$ $\frac{1}{2(n+1)^3-1} < 0.001 \quad \boxed{N=7} \quad 7 \text{ terms}$