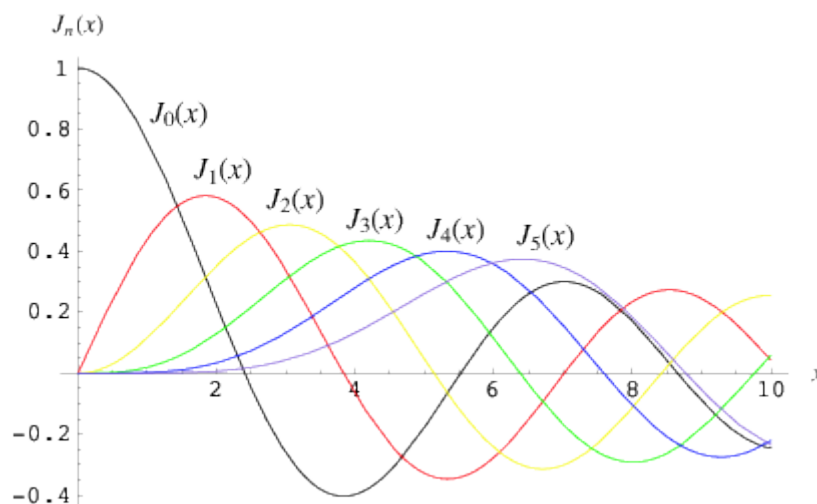


WORKSHEET XV

POWER SERIES



Bessel functions may be expressed as power series

For each of the following power series, determine the *interval of convergence*. Consider end-point behavior as well.

(a) $\sum \frac{x^n}{n^3}$

(b) $\sum_{n=1}^{\infty} \frac{x^n}{n!}$

(c) $\sum_{n=1}^{\infty} \frac{(x-3)^n}{n^2}$

(d) $\sum_{n=1}^{\infty} \frac{(x+5)^n}{(2n+1)}$

(e) $\sum_{n=1}^{\infty} n! x^n$

(f) $\sum_{n=1}^{\infty} \frac{3n+5}{2015n+1} (x-1)^n$

$$(g) \sum_{n=1}^{\infty} \left(1 + \frac{1}{n}\right)^n (x+4)^n$$

$$(h) \sum_{n=2}^{\infty} \frac{(x-1)^n}{n \ln n}$$

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

$$(j) \sum_{n=1}^{\infty} \frac{x^n}{n + 5^n}$$

$$(k) \sum_{n=1}^{\infty} \frac{n!}{n^n} x^n$$

$$(l) \sum_{n=1}^{\infty} \frac{n x^{2n}}{1 + 3^n}$$



If people do not believe that mathematics is simple, it is only because they do not realize how complicated life is.

- John von Neumann