

1) Find the value of

a)  $\sum_{k=3}^{+\infty} \frac{1}{5^k}$

b)  $\sum_{k=50}^{+\infty} \left(\frac{2}{\pi}\right)^k$

c)  $\sum_{k=0}^{+\infty} b_k$ , where  $b_{2k} = \left(\frac{1}{2}\right)^k$   
 $b_{2k+1} = \left(\frac{1}{3}\right)^k$

2) For which values of  $x$  does  $\sum_{k=0}^{+\infty} (-\sqrt{7-x^2})^k$  converge?

3) Determine if the following series converge or diverge

a)  $\sum_{n=2}^{+\infty} \frac{1}{(n-2)!}$

b)  $\sum_{n=0}^{+\infty} a_n$ , where  $a_{n+1} = \frac{a_n}{2} + \frac{1}{a_n}$  (Assume  $\lim_{n \rightarrow +\infty} a_n$  exists)

c)  $\sum_{n=0}^{+\infty} n^{-n}$

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

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

4) For which values of  $c$  is  $\sum_{n=0}^{+\infty} e^{c \cdot n}$  convergent?