

2. [4 points]

- a. [2 points] You are given that the power series  $\sum_{n=0}^{\infty} C_n(x+3)^n$  converges when  $x = -6$  and diverges when  $x = 1$ . What are the largest and smallest possible values for the radius of convergence  $R$ ?

$$\underline{\hspace{2cm}} \leq R \leq \underline{\hspace{2cm}}$$

- b. [2 points] Give the exact value of the infinite series

$$\sum_{n=0}^{\infty} \frac{(-1)^{n+1} 3^{n+1}}{n!} = -3 + 9 - \frac{27}{2} + \frac{81}{6} - \frac{243}{24} + \dots$$

3. [5 points] Determine whether the following integral converges or diverges. If the integral converges, circle the word “converges”. If the integral diverges, circle “diverges”. In either case, **you must show all your work and indicate any theorems you use.**

$$\int_0^1 \frac{\cos(x)}{x^2} dx$$

CONVERGES

DIVERGES