5. [10 points] Compute the **exact value** of each of the following. You do not need to show work.

    a. [2 points] Find the radius of convergence R of $\displaystyle\sum_{n=1}^{\infty} \frac{5(x-1)^n}{3^n}$.

Answer: $R =$ _____

    b. [2 points] $\displaystyle\sum_{n=1}^{100} e^n$

Answer: $\displaystyle\sum_{n=1}^{100} e^n =$ _____

    c. [2 points] $\displaystyle\lim_{n\to\infty} \int_{-\infty}^{n} p(t)\,dt$, where $p(t)$ is a probability density function.

Answer: $\displaystyle\lim_{n\to\infty} \int_{-\infty}^{n} p(t)\,dt =$ _____

    d. [2 points] Find the function $f(x)$ satisfying $\displaystyle\int x^3 e^x\,dx = x^3 e^x - \int f(x)\,dx$

Answer: $f(x) =$ _____

    e. [2 points] $\displaystyle\sum_{n=0}^{\infty} \frac{(-4)^n}{(2n)!}$

Answer: $\displaystyle\sum_{n=0}^{\infty} \frac{(-4)^n}{(2n)!} =$ _____