3. [9 points] The Taylor series centered at $x = 1$ for a function $T(x)$ is given by:

$$T(x) = \sum_{n=0}^{\infty} \frac{(n!)^2}{(-5)^n \cdot (2n)!} \, (x-1)^{4n+3}.$$

    a. [6 points] Find the **radius of convergence** of the Taylor series above. Show your work. Do not attempt to find the interval of convergence.

Answer: _____

    b. [3 points] Compute $T^{(123)}(1)$. Show your work. You do not need to simplify your answer.

Answer: $T^{(123)}(1) = $ _____