Read each question carefully and be sure to SHOW ALL WORK. Correct answer without proper justification will not receive a "Complete" grade. Paç fat! Good luck!

Name: _____

LO 12. Series Challenge. I can work with series and power series creatively in new situations that require a deep understanding of them.

Criteria for Success: I can solve conceptual questions related to series and power series that lie on the top half of Bloom's Taxonomy (analyze, evaluate, and create).

Question: Let $f(x) = \sum_{n=1}^{\infty} \frac{(-1)^{n+1}2^n}{n} x^{2n}$ be a power series. Answer the following questions:

(a) Find the function representation of the series $f(x)$. You may assume the Taylor series expansion of the most common functions and start from there, or derive it from scratch by taking derivatives or integrals of known power series.

(b) Find the radius of convergence of $f(x)$.

(c) Finally, combine the two parts above to find the exact value of $f(0.1) = \sum_{n=1}^{\infty} \frac{(-1)^{n+1}2^n}{n}(0.1)^{2n}$, or conclude the series is divergent.