

YOUR NAME: _____

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Read each problem **very carefully** before starting to solve it. Each problem is worth 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Find the radius and the interval of convergence of the power series

$$\sum_{n=1}^{\infty} \frac{(x-3)^n}{4^n n^2}.$$

2. Compute Maclaurin series for the following functions, recalling that $\frac{1}{1-x} = 1 + x + x^2 + \cdots = \sum_{n=0}^{\infty} x^n$, if $|x| < 1$.

(a) $\frac{1}{1+x^2}$.

(b) $\frac{2x}{(x^2+1)^2}$.

Table of Methods:

Sequences	Series	Series w/ Positive Terms
1. Function Method	1. Definition	1. Integral Test
2. Geometric Sequences	2. Telescoping Series	2. p Series
3. Limit Laws	3. Linearity	3. Comparison Test
4. Squeeze	4. Geometric Series	4. Limit Comparison
5. Continuity	5. Divergence Test	
	6. Ratio Test	
	7. Root Test	