

Quiz #8

Monday, November 28 2016

Duration: 20 min

NAME: _____

Please write clearly and properly.

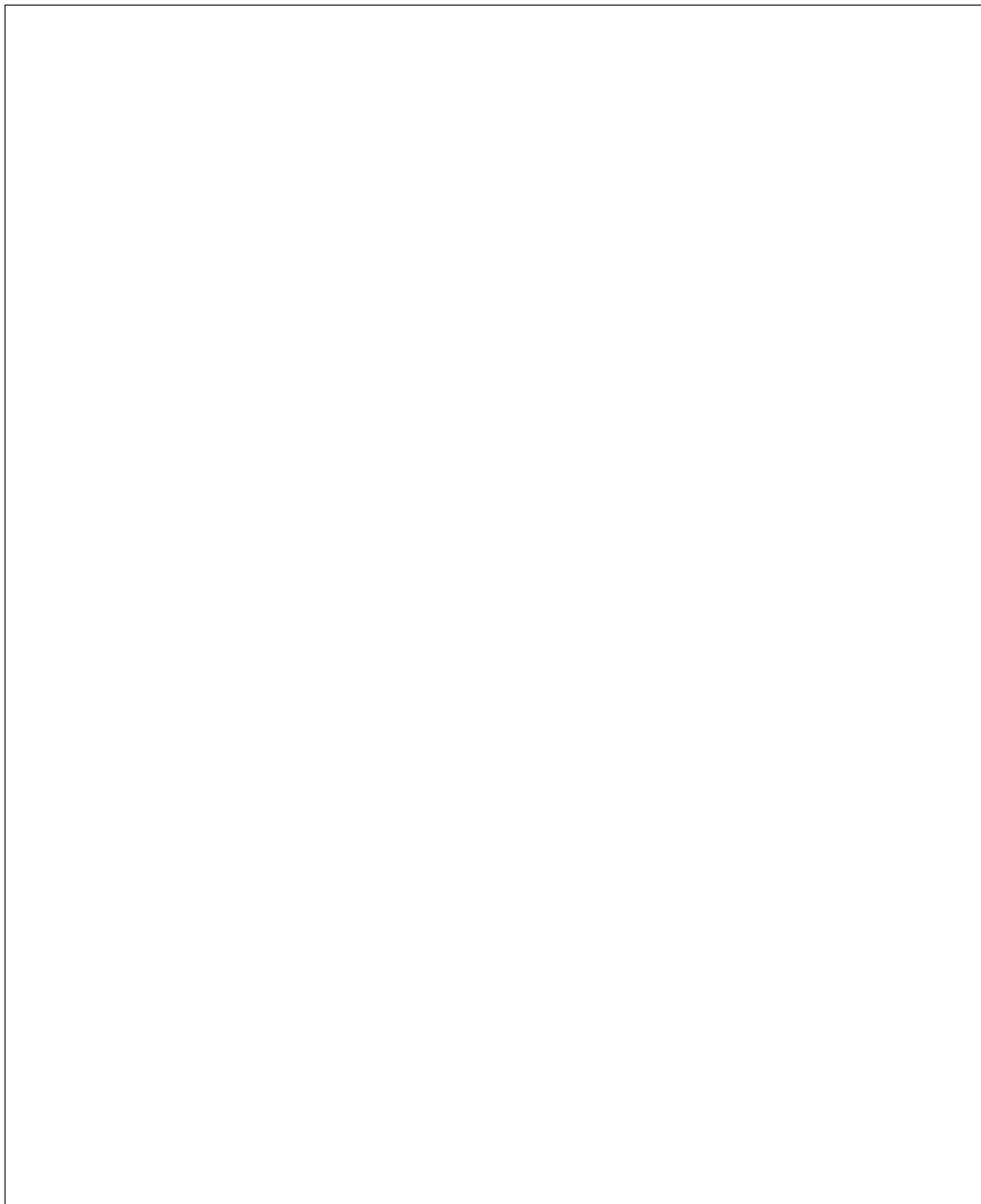
Problem	Grade
1	
2	
Total	

Problem 1 (~ 4 points.).

Find the radius of convergence and the domain of convergence of each of the following power series:

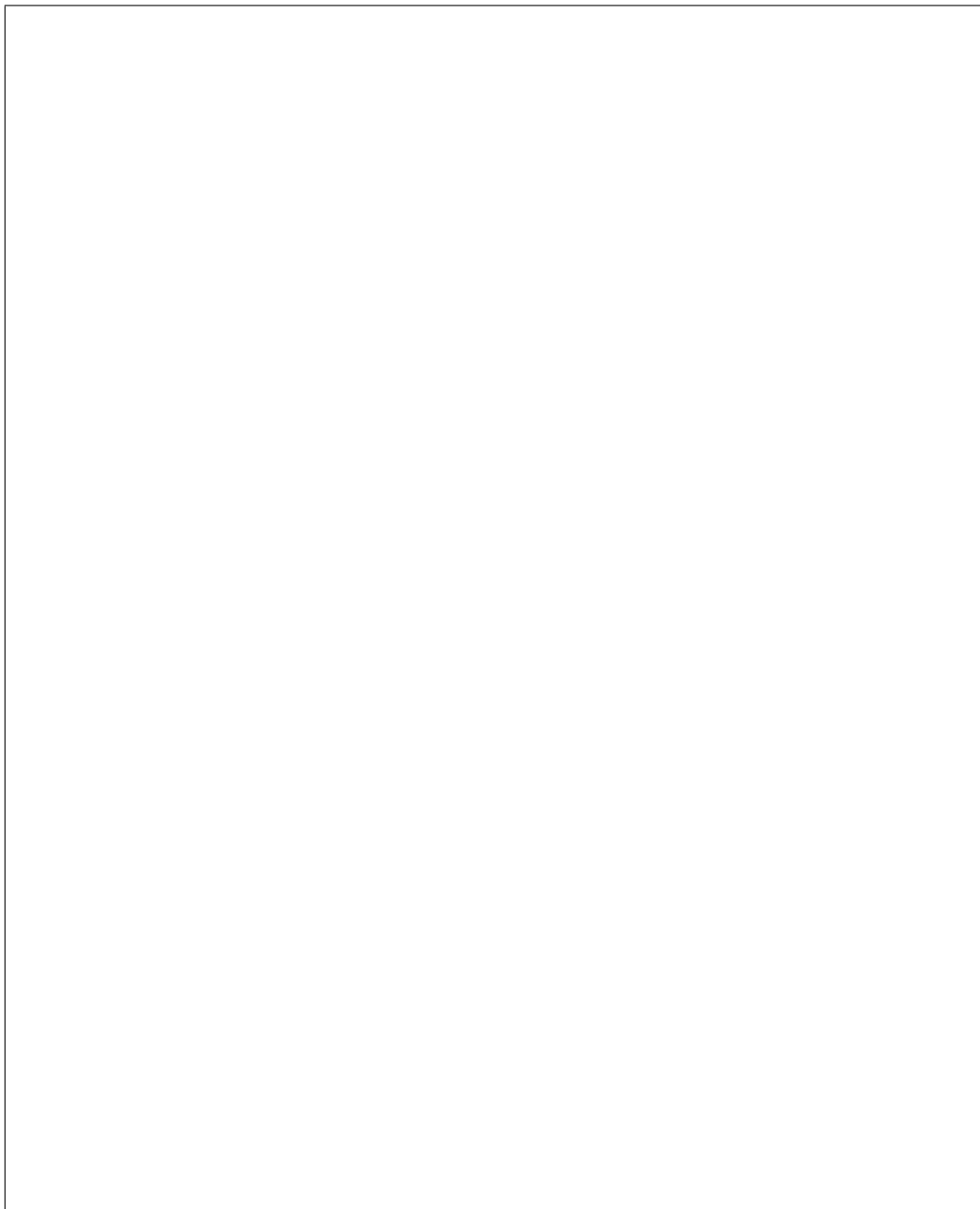
(1)

$$\sum_{n=0}^{+\infty} e^{-4i-n} z^n$$



(2)

$$\sum_{n=0}^{+\infty} \frac{2^n}{n^2} (z+i-1)^n$$



Problem 2 (~ 7 points.).

True or false? No explanations are required.

- (1) A power series always converges at least at one point of the boundary of its domain of convergence.
- (2) Some power series converge for no value of $z \in \mathbb{C}$.
- (3) Some power series converge for every value of $z \in \mathbb{C}$.
- (4) A power series converges uniformly in its domain of convergence.
- (5) A power series converges pointwise in its domain of convergence.
- (6) A power series is analytic in its domain of convergence.
- (7) A polynomial function is analytic on \mathbb{C} .
- (8) An analytic function is locally the uniform limit of a sequence of polynomials.
- (9) Every analytic function is holomorphic.
- (10) Every holomorphic function is analytic.
- (11) Some analytic functions are discontinuous.
- (12) Let f be an analytic function on \mathbb{C} . Then the coefficients of its power series representation at $z_0 \in \mathbb{C}$ do not depend on z_0 .
- (13) Let f be an entire function. For any $z_0 \in \mathbb{C}$, there exists a power series centered at z_0 which represents f , and the radius of convergence is $R = +\infty$.
- (14) Let f be an analytic function defined in a disk $D(a, r)$. Assume that $f^{(n)}(a) = 0$ for every positive integer n . Then f is a constant function.