

Exam—Calculus

November 2019

[1] Find the radius of convergence of the power series

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

[2] Let

$$f(x, y) = \cos x \cos y,$$

be defined on the region $R = \{(x, y): x^2 + y^2 < 1\}$. Find all the critical points, and determine whether the function attains its maximum or minimum there.

[3] Evaluate

$$A = \int_0^1 \left(\int_y^1 e^{x^2} dx \right) dy.$$