Bilkent University

Quiz # 05
Math 102 Section 09 Calculus II
11 March 2024 Monday
Instructor: Ali Sinan Sertöz

Name & Lastname: .....

Department: ..... Student ID: .....

Q-1) Assume that y is an analytic function of x,

$$y = a_0 + a_1 x + a_2 x^2 + \cdots + a_n x^n + \cdots ,$$

and satisfies the initial value problem

$$y'' + 4y = 0,\ y(0) = 1,\ y'(0) = 0.$$

Show by induction that

$$a_{2n+1} = 0 \ \text{ and } \ a_{2n} = (-1)^n \frac{4^n}{(2n)!}, \ \text{ where } \ n = 0, 1, 2, \ldots .$$

Then evaluate $y(\pi/6)$.

Show your work in detail. Correct answers with no justification will not get any credit.

Grading: 8+2=10 points

Solution: (Grader: melis.gezer@bilkent.edu.tr)