

Serial No.: _____ Student Name: _____ Student Number: _____

Instructor: M. Z. Abu-Sbeih

Math 101- Q4

Date: 11-11-2018

SHOW ALL YOUR WORK. NO CREDITS FOR ANSWERES WITHOUT JUSTIFICATIONS

Show all your work. NO credits for answers not supported by work.

1. (8 Points) Find $y'(0)$ where $y = (e + \sin x)^{\tan x}$.
2. (8 Points) The position function of a particle is $S(t) = 1 + 3t^2 - t^3$, where t is in seconds and $t \geq 0$. Find the **distance traveled** during the first 3 seconds.
3. (8 Points) If $y = x \ln x$ find $y^{(n)}$, $n \geq 2$.
4. (8 Points) Ahmad starts walking north at a speed of 1.5 m/s, and Ali starts walking west at the same point P at the same time at a speed of 2 m/s. At what rate is the distance between the Ahmad and Ali increasing 1 **minute** later?
5. (8 Points) Consider a cube of variable size. (The edge length is increasing.) Assume that the volume of the cube is increasing at the rate of $10 \text{ cm}^3/\text{minute}$. How fast is the surface area increasing when the edge length is 8 cm?