

Serial No.: \_\_\_\_\_ Student Name: \_\_\_\_\_ Student Number: \_\_\_\_\_

Instructor: M. Z. Abu-Sbeih

Math 101- Q4

Date: 17-3-2019

**SHOW ALL YOUR WORK. NO CREDITS FOR ANSWERES WITHOUT JUSTIFICATIONS**

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

1. ( 10 Points) Find the slope of the tangent line to the curve  $y = (1 + \sin x)^{\ln x}$  at the point (1,1).
2. ( 10 Points) Find the derivative  $y'$  of the curve  $x^2y^3 + \sin(x - y) = 1$  at the point (1,1).
3. ( 10 Points) The position function of a particle is  $S = f(t) = 2t^3 - 9t^2 + 12t$ , where  $t$  is in seconds and  $t \geq 0$ . Find the **distance traveled** during the first 3 seconds.
4. ( 10 Points) The length of a rectangle is twice the width. If the width is increasing at a rate of 2mm/min., how fast the area is increasing when the width is 10 cms?