King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math 101 (151) Sec 01 - Quiz 5

Name: ID: Serial No.:

1. Two sides of a triangle are 4 m and 5 m in length and the angle between them is increasing at a rate of 0.06 rad/s. Find the rate at which the area of the triangle is increasing when the angle between the sides of fixed length is $\pi/3$.

2. Use a linear approximation to estimate $e^{-0.015}$

3. The radius of a circular disk is given as 24 cm with a maximum error in measurement of 0.2 cm.

   (a) Use differentials to estimate the maximum error in the calculated area of the disk.

   (b) What is the relative error? What is the percentage error?

4. Find the value of $\tanh(\ln 3)$

5. If $f(x) = \text{sech}^2(\ln(x+2))$, find the value of $f'(0)$

6. Find the critical points of $f(x) = |x^3 - 4x|$

7. Find the absolute maximum and absolute minimum values of $f(x) = \cos^2 x - \cos x$ in $[\frac{-\pi}{2}, \pi]$