

Department of Mathematics and Statistics  
King Fahd University of Petroleum and Minerals  
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Math 101-101

Quiz # : 3

Name : = ----- ID# -----

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Q 1 Let  $f(x) = \sqrt{5}\left(\frac{2x^2}{9-x^2}\right)$

- Evaluate  $f^{(1)}(x)$
- Evaluate  $f^{(2)}(x)$
- Find the intervals where  $f(x)$  is increasing or decreasing
- Find the relative extrema of the function
- Discuss the convexity of the function
- Plot the graph of the function

Q. 2 Find the maximum volume of the right circular cylinder that can be inscribed in a cone of altitude 24cm and base radius, if the axes of the cone and cylinder coincide.6cm

Q3. If the surface are of a sphere is increasing at the rate of  $5cm^2 / \text{min}$  then find the rate of change of the volume of the sphere when  $r = 25cm$

Q.4 Discuss the concavity of  $f(x) = 3(x-7)^{1/3} \quad -\infty < x < \infty$ .