**MAT 110: BASIC CALCULUS**

**CAT 2 NOV2013**

1. Differentiate each of the following with respect to x:
   1. . (2 marks)
   2. . (3 marks)
   3. . (2 marks)
   4. . (3 marks)
   5. . (3 marks)
   6. . Use logarithmic differentiation). (4 marks) 
   7. . (3 marks)
2. Find the equation of the tangent and normal at . (3 marks)
3. Evaluate . (2 marks)
4. An object moves along a co-ordinate line, its position at each time 

given by . Find the position, velocity, acceleration, and

speed at time . (4 marks)

1. Determine the stationary points of the curve , state

their nature and hence sketch a graph of the curve. (5 marks)

1. Find the value of  prescribed in Rolle’s theorem for  on

the interval . (3marks)

1. Find the intervals on whichincreases and the intervals

on which decreases. (4 marks)

1. Find given . (3 marks)