KING FAHD UNIVERSITY OF PETROLEUM & MINERALS

DEPARTMENT OF MATHEMATICS & STATISTICS

MATH101 - Section 09 (Term 142)

Date: May 10, 2015 **Quiz 5** Duration: 30 minutes

Family Name: _____ **ID #:** __ __ __ __ __ __ __ __ __ **Serial #:** __ __

1. Assume c is a number satisfying the hypotheses of the ***Mean Value Theorem*** when applied to the function $f(x) = \ln(x-1)$ on $[2, 4]$. Find c. **(5 points)**

2. Use the second derivative test, only, to find the local minimum and the local maximum of the function:

$$y = x^3 - 3x + 3$$

(**5 points**)

3. Given that:

$$f(x) = \frac{8x^3}{(x-1)^3}$$

(a) Determine the domain, of $f(x)$, and the critical point(s), if any.

(b) Describe where the function is increasing or decreasing.

(c) Describe where the function is concave up or concave down.

(10 points, 3 + 3 + 4)