Department of Mathematics and Statistics KFUPM
MATH 101-09 Quiz#2, Time: 40 mins

Student's Name: _____ ID: _____Section No: _____

Q.No.1:- Let $f(x) = \sqrt{1+\sqrt{x}}$. Use the definition of derivative to find $f'(x_0)$.

Final Answer (**2 point**): _____

Work Shown (**5 points**):

Q.No.2:- Use the limits to find all horizontal asymptotes to the curve of the function:

$f(x) = \sqrt{4x^2 + 2x} - \sqrt{4x^2 + 5x}$

Final Answer (**2 point**): _____

Work Shown (**4 points**):

Q.No.3:- Let

$$f(x) = \begin{cases} \dfrac{(x-1)(x+3)}{(x-1)^n}, & x > 1 \\ x^2 + 3, & x \leq 1 \end{cases}$$

where n is a nonnegative integer, $(n \geq 0)$

(a) Use limits to find the value(s) of n for which the function is continuous at every x.

Final Answer (**1 point**): _____

Work Shown (**5 points**):

(b) Use limits to find the value(s) of n for which the function has infinite discontinuity at $x = 1$.

Final Answer (**1 point**): _____

Work Shown (**5 points**):