

King Fahd University of Petroleum and Minerals  
Department of Mathematics and Statistics  
Math 101 (131) - Quiz III

Name:

ID:

Serial No.:

1. If the position in meters of a body moving along s-axis is  $s = t^3 - 12t^2 + 45t$  in the time interval  $[0, 10]$ , then find the time interval(s) where the particle is moving forward

2. Find  $\frac{d^{999}}{dx^{999}} \sin x$

3. Find the points on the curve  $y = \frac{(x+1)(3x-1)}{x-2}$  where the tangent line is horizontal.

(Just find the x-coordinate)

4. For what values of  $a$  and  $b$  is

$$f(x) = \begin{cases} x^2 + ax + b & x < 0 \\ 2 \cos x + \tan x & x \geq 0 \end{cases}$$

differentiable everywhere.

5. Find  $\lim_{x \rightarrow \pi/6} \frac{\cot x - \sqrt{3}}{x - \pi/6}$