

King Fahd University of Petroleum and Minerals  
Department of Mathematics and Statistics  
Math 101 (142) Sec 10 - Quiz 3

Name:

ID:

Serial No.:

1. If the tangent line to the parabola  $y = 2x^2 + 3x + 2$  at the point  $(a, b)$  is perpendicular to the line  $x + 11y = 0$ . Find the value(s) of  $a$  and  $b$ .

2. Find the value(s) of  $a$  and  $b$  that makes the following function differentiable for all  $x$ -values

$$f(x) = \begin{cases} bx + a + 1 & x \leq 2 \\ ax^2 + 2bx & x > 2 \end{cases}$$

3.  $\lim_{x \rightarrow -1} \frac{x^{2/9} - 1}{x + 1}$

4. If  $f(x) = |x + 1| + 3|x - 3|$ , then find  $f'(-3) + f'(1) + f'(6)$

5. The position function of a body moving in a straight line is

$$s(t) = 2t^3 - 9t^2 + 12t, \quad t \geq 0$$

When the body change direction?

6. Let  $y = \left(\frac{u-3}{u+3}\right)^2$  and  $u = e^{3x} \cos x$ . Find  $\frac{dy}{dx}$  when  $x = 0$