King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math 101 (142) Sec 15 - 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 $x + 7y = 0$. 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

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

3. $\lim_{x \to 1} \frac{x^{50} - 1}{x - 1}$

4. If $f(x) = |x + 1| + 3|x - 2|$, then find $f'(-2) + f'(1) + f'(4)$

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

$$s(t) = 2t^3 - 15t^2 + 36t, \quad t \geq 0$$

When the body change direction?

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