KFUPM, DEPARTMENT OF MATHEMATICS AND STATISTICS

MATH 101: QUIZ 1, SEMESTER (141), SEPTEMBER 16, 2014

Name : ....

ID : ..... Section : 30

Exercise	**Points**
1	_____ 4
2	_____ 3
3	_____ 3
Total	_____ 10

Exercise 1. Let $\mathcal{C}$ be the curve given by the equation $y = f(x)$, where f is a function. Suppose that $P(1, 6)$ is a point of the curve $\mathcal{C}$ and that $\mathcal{C}$ has a tangent line L at P passing through the point $Q(2, 13)$.

(**a**) Find the slope and an equation of L.

(**b**) Suppose, in addition, that $f(x) = ax^2 + bx + 1$, then find the real numbers a, b.

Exercise 2. Consider the function $f(x) = \dfrac{x^6 - 1}{x^3 + 1}$, with domain $D = \mathbb{R} \setminus \{-1\}$.

What is the limit of $f(x)$ as x approaches -1?

Exercise 3. For $f(x) = \sqrt{5x+6}$, $x_0 = 2$, $L = 4$ and $\varepsilon = 1$, find a $\delta > 0$ such that for each $x \geq -\frac{6}{5}$, we have

$$0 < |x - x_0| < \delta \Longrightarrow |f(x) - L| < 1.$$