KFUPM, DEPARTMENT OF MATHEMATICS AND STATISTICS

MATH 101: QUIZ 3, SEMESTER (141), NOVEMBER 13, 2014

Name : ....

ID : ..... Section : 30

Exercise 1. Find the two points where the curve

$$x^2 + xy + y^2 = 7$$

crosses the x-axis, and show that the tangents to the curve at these points are parallel. What is the common slope of these tangents?

Exercise 2. Find the derivatives of the functions

(a) $f(x) = \sin(x)\tan(x)$

(b) $(\sin(x) + \cos(x))\sec(x)$

Exercise 3. Find the following limit

$$\lim_{x \longrightarrow \frac{\pi}{6}} \frac{\sin x - \frac{1}{2}}{x - \frac{\pi}{6}}.$$

Exercise 4. Find y'' , if $y = 9\tan(\frac{x}{3})$.

Exercise 5. Find an equation of the normal line to the curve $x^2y^2 = 9$ at the point $P = (-1, 3)$.

Exercise 6. Find the derivative of the function

$$f(x) = \ln\left[\frac{1}{x\sqrt{x+1}}\right].$$

Exercise 7. Use logarithmic differentiation to find $\dfrac{\mathrm{d}\, y}{\mathrm{d}\, x}$, if

$$y = \frac{x\sqrt{x^2+1}}{(x+1)^{2/3}};$$