Mathematics L2 **EXAM 3** A G221(2MG01) 9.1.19

Exercise 1 Consider the function $f(x)=\frac{sin^2(x)}{\cos(x)}$

1) Give the domain.
2) Find a stationary point with its abscissa in [9;10].

Exercise 2 Determine the inflexion point(s) for the function

$f(x) = 9x^5+20x^4-10x^3-60x^2 + 60x + 1.$

Exercise 3 1) Study the function $f(x)=\frac{4x}{x^2+1}$ (without $f''(x)$).

2) Add, on the graph, the inflexion point(s), if any.
3) Calculate the angle between the curve and the y-axis.
4) Determine, on the curve, one point for which the tangent is parallel to $\begin{pmatrix}25\\-12\end{pmatrix}$.

Exercise 4 Given the function $f(x) = \sqrt{4x^2-9} + k \cdot x \quad (k \in \mathbb{R})$.

1) Give the domain.
2) Show that there is no extremum if $k \in]-2;2[$.
3) Determine, in terms of k, the asymptote as $x \to \infty$ (Δ here $k \in \mathbb{R}_+$).

Exercise 5 Find, with a calculus, on the line : $12x + 16y - 25 = 0$ the closest point to the origin.

Δ no variation table expected.