LDDR – Niveau 1: TE 17 - Analyse

2MG Level 1	CALCULUS 1	TEST 3
2018/01/16		2MG03

_____ pts   Name: _____   90'

WITH CALCULATOR AND FORMULAIRE
*INDICATE YOUR COMPUTATIONS*

➤ **EXERCISE 1**

Determine the acute angle at the intersection point of the curves $f(x) = x^3 + x^2 - 11$ and $g(x) = x^2 - 3$.

➤ **EXERCISE 2**

The curve $y = f(x) = \sqrt{3x + 8}$ is represented.

a) Compute the distance from the point $(\frac{1}{3}; ...)$ of the curve to the origin $(0; 0)$.

b) Determine, with computations, the coordinates of the point P on the curve that is the closest to the origin, so whose distance to the origin is the smallest.
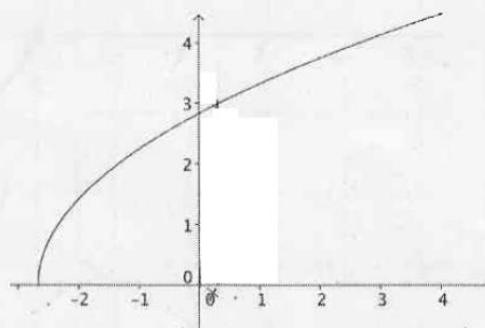
➤ **EXERCISE 3**

The graph of the function $f(x) = 6\sin(x) - 3\cos(x)$ has an infinite number of stationary points. Give the type and coordinates of two of them, not of the same type.
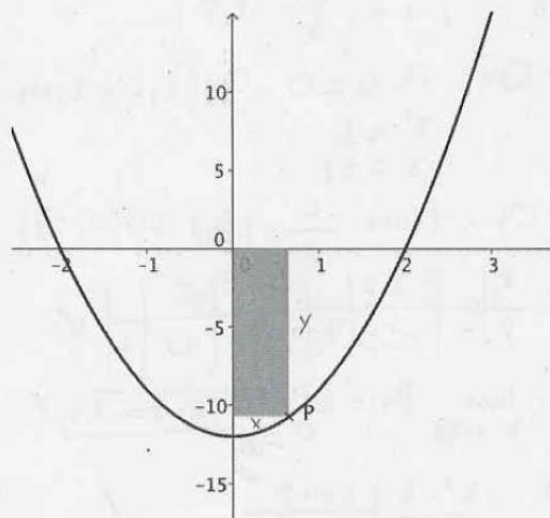
➤ **EXERCISE 4**

Here is the graph of the function $f(x) = 3x^2 - 12$. We consider P a point on the graph **in quadrant** Q_{IV}.

The colored rectangle is rotated around the *y*-axis and it generates a cylinder.

Determine the largest volume that such a cylinder can have.

BONUS : Justify the fact that it is a maximum.

> **EXERCISE 5**
>
> Study the function $f(x) = \frac{x^2-4}{2x+5}$.

Domain, intersection with the axes, table of signs, vertical asymptote/hole, slant/horizontal asymptote, derivative, domain of the derivative, stationary points, table of variation, … and graph.