

LDDR- Niveau 2 : TE 9 – Fonctions-Equations

Mathematics L2

EXAM 3

B

G121(1MG01)

24.11.17

Exercise 1 Solve the following equations:

- 1) $|3x - 5| = |1 - x|$
- 2) $|3x + 1| - |2x - 1| = x$
- 3) $||2x - 1| - 3| = 2$
- 4) $6x^3 - x^2 - 31x - 24 = 0$

- 5) $3x^3 - 2x^2 - 21x + 14 = 0$ knowing that $x_1 = \sqrt{7}$ is a solution.
Indication: use the two first relations of Viete to find x_2 and x_3 .

Exercise 2 Determine the intersection point(s) between the graphs of the functions

$$f_1(x) = \frac{6}{x} \text{ and } f_2(x) = x^2 - 2x - 1$$

- Exercise 3
- a) Divide the polynomial $a(x) = x^4 - 5x + 1$ by the polynomial $b(x) = x^3 - 2x^2$.
 - b) The polynomial $x^3 + cx^2 + dx - 8$ has factors $(x + 1)$ and $(x + 2)$.
Find c and d .

Exercise 4 Given the function $f(x) = x^3 - x^2 - x + 1$.

- 1) Find the intercepts and study the sign of the function f .
- 2) Sketch the graph of f [U:6s]. Indication: $-\frac{1}{3}$ is the abscissa of the maximum.
- 3) Give the greatest domain containing zero for which the function f is one-one.
- 4) Sketch, in the same set of axes, the graph of f^{-1} without looking for the expression of f^{-1} .

Exercise 5 a) Consider a function f . Give its domain, find its inverse and state its range.

$$1) f(x) = \frac{3x-2}{5} \quad 2) f(x) = \frac{2x}{3x-5} \quad 3) f(x) = 2 - \sqrt{\frac{x-5}{3}}$$

- b) Determine conditions on a, b, c, d so that the function $f(x) = \frac{ax+b}{cx+d}$ is a self-inverse function.