

## 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 Viète 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.