

EXERCISE 1 (~ 18 pts)

NAME : ...

Solve the following equations:

a. $117 + x^3 = \frac{1000}{x^3}$

b. $1 - \frac{x^2-4}{3x+6} = 0$

c. $\frac{x-12}{\sqrt{36-x}} = 2$

d. $4x^7 - 9x^9 = 0$

e. $2 - |3x - 1| = x$

EXERCISE 2 (~ 12 pts)

- Determine the quotient and remainder of $4x^3 - 2x^2 + 10x + 1$ divided by $2x^2 - 3$
- Completely factorize $p(x) = x^3 + 2x^2 + 2x + 1$ given that $p(-1) = 0$.
- Determine the value(s) of $a \in \mathbb{R}$ such that $ax^3 - a^2x - 42$ is divisible by $x + 2$
- Determine $k \in \mathbb{R}$ such that $p(x) = -3x^2 + kx - 1$ has only one root.

EXERCISE 3Determine all the roots of the polynomial p , knowing that

- its degree is 2,
- it is divisible by $x + 5$,
- $p(0) = 50$, and
- the division of p by $x - 2$ gives a remainder of 35

EXERCISE 4

Solve the following system:

$$\begin{cases} a + 2b - c = -8 \\ 2a + b + c = 11 \\ a + b - 2c = -5 \end{cases}$$