Savoir Faire Mathematique

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Lecture 1: Title of the lecture

di 29 jul 16 :00

Exercice 1.4

$\forall n \in \mathbb{N}\ \exists a_1, ..., a_k$ such that

$$\sum_{k=0}^{N} a_k 10^k = n$$

Thus

$$n = \sum_{k=1}^{N} a_k(10^k - 1) + \sum_{k=0}^{N} a_k$$

If 9 | n $\Rightarrow n = 9u$

$$9u = \sum_{k=1}^{N} 9a_k 10^{k-1} + \sum_{k=0}^{N} a_k \Rightarrow 9|\sum_{k=0}^{N} a_k$$

Exercice 1.6

$(333)^{\frac{1}{3}}$ **irrationel**

Par l'absurde, supposer que

$$\exists a, bin\mathbb{N}|\frac{a}{b} = 333^{\frac{1}{3}}$$

$\frac{a}{b}$ sous forme simplifiee, $\Rightarrow$

$$\frac{a^3}{b^3} = 333$$
$$a^3 = 333b^3$$
$$3|a \Rightarrow 27|a^3 \Rightarrow 3|b$$

$\lightning$ Contradiction car alors $\frac{a}{b}$ pas simplifie

Exercice 4.1
Theoreme d'Euclide et de la hauteur

Prouver les deux theoremes

On sait que

$$a^2 + b^2 = c^2 \tag{1}$$

$$a \cdot b = c \cdot h \tag{2}$$

$$b^2 = b'^2 + h^2 \tag{3}$$

$$a^2 = a'^2 + h^2 \tag{4}$$

$$\frac{b'}{b} = \frac{h}{a} \tag{5}$$

$$\frac{a}{a'} = \frac{h}{a} \tag{6}$$

Par 3 et 4, on sait que

$$\begin{aligned}
b^2 &= b'^2 + a^2 - a'^2 \\
b^2 - a^2 &= (b' - a')(b' + a') \\
b^2 - a^2 &= b' \cdot c - a' \cdot c \\
b^2 &= b' \cdot c - a' \cdot c \\
b^2 &= b'c - \frac{ahc}{b} + a^2 \\
&\Rightarrow ahc = a^2 b \\
\Rightarrow b^2 = b'c &= a^2 \frac{b}{b} + a^2 = b'c
\end{aligned}$$

Theoreme de la hauteur

$$\begin{aligned}
ab = ch5 \Rightarrow b' &= \frac{hb}{a} 6 \Rightarrow a' = \frac{ah}{b} \\
\Rightarrow a' \cdot b' &= \frac{bhah}{ba} = h^2
\end{aligned}$$

Exercice 4.4

$$\begin{cases} 3x + y - 22 &= 0 \\ x - 4y + 10 &= 0 \end{cases} \tag{7}$$

$$\begin{aligned}
13y - 52 &= 0 \\
y &= 4 \\
\Rightarrow x - 6 &= 0 \\
\Rightarrow \vec{AI} &= \begin{pmatrix} 4 \\ -1 \end{pmatrix}
\end{aligned}$$

$$\Rightarrow 4x - y = 7$$

Substitute value for P

$$\begin{pmatrix} 2 \\ 3 \end{pmatrix} \begin{pmatrix} 1 \\ 3 \\ 4 \\ 6 \end{pmatrix}$$

Proposition 1 (exemple)
a l aise ou quoi

Lecture 2: wtf

Thu 03 Sep

Hi there

Lecture 3: and another one

Thu 03 Sep

Hi again

Lecture 4: some serious shit

Fri 04 Sep

Seems to work

Lecture 5: test figures

Fri 04 Sep

$$\int_{-\infty}^{+\infty} e^{-x^2} dx = \sqrt{\pi}$$

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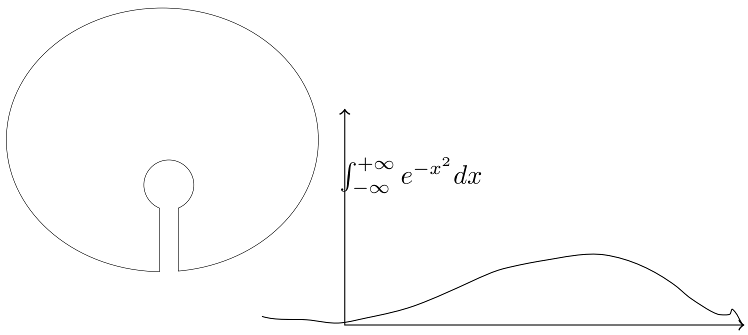

FIGURE 1 – test-figure