

Übungen in Analysis ◇ Exercices en analyse ◇ T. I1 ◇ I / 11

Verbesserung resp. Bearbeitung der letzten Prüfung:

- *Correction resp. étudier l'examen dernier:*

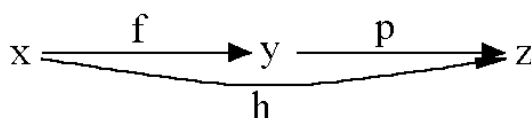
Probl. 1 Diagramme? • *Diagrammes?*

- (a) $f_1(x) = \frac{x^2}{x^2 + \sin(x)^2}$, $D_{f_1} = [-6, 6]$
 (b) $f_1(x) = 1 \Rightarrow x = ?$ Ohne Rechner! • *Sans calculatrice!*
 (c) $f_2(x) = -1 + \sin([x])$, $D_{f_2} = [-6, 6]$
 (d) $f_3(x) = \cos(e^{|x|})$, $D_{f_3} = [-2.5, 2.5]$

Probl. 2 $x = 4 + \frac{5}{5 + \frac{5}{5 + \frac{5}{\ddots}}} = ? \quad \rightsquigarrow \quad x \in \mathbb{Q} ?$

Ohne Rechner! • *Sans calculatrice!*

Probl. 3



$$\begin{aligned} f(x) &= e^x \\ p(x) &= \frac{1}{2} \ln(x^2) \end{aligned}$$

- (a) $h(x) = (p \circ f)(x) = ?$
 $\rightsquigarrow$ Diagramm? • *Diagramme?*
 (b) $h(x) = (f \circ p)(x) = ?$
 $\rightsquigarrow$ Diagramm? • *Diagramme?*
 (c) $h(x) = (f(p(x)^2)) = ?$
 $\rightsquigarrow$ Diagramm? • *Diagramme?*

Probl. 4 $f(x) = (-1 + x) \cdot (-1 + x^2)$, $p(x) = -8 + 12x - 6x^2 + x^3$

- (a) $h(x) = f(x) \cdot p(x)$
 i. Nullstellen? • *Zéros?* Ohne Rechner! • *Sans calculatrice!*
 ii. Diagramm? • *Diagramme?*
 (b) $u(x) = \frac{f(x)}{p(x)}$
 i. Pole? • *Pôles?* Ohne Rechner! • *Sans calculatrice!*
 ii. Diagramm? • *Diagramme?*

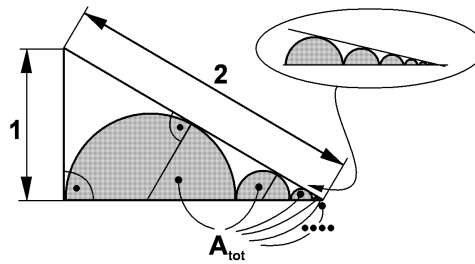
Probl. 5 $f(x) = e^{-\sin(x)^2}$, $g(x) = -0.5x$

- (a) Diagramm? • *Diagramme?*
 (b) Verhalten für grosse $|x|$?
 • *Comportement pour des $|x|$ qui sont grands?*
 (c) $m \leq f(x) \leq M \rightsquigarrow m, M = ?$ Ohne Rechner! • *Sans calculatrice!*
 (d) $f(x) = g(x) \rightsquigarrow x \approx ?$

Probl. 6 $4^{2x} = 3^x \cdot \pi^5 \cdot 4^{-3x} \rightsquigarrow x = ?$ Ohne Rechner! • *Sans calculatrice!*

$\rightsquigarrow$

Probl. 7 $A_{tot} = ?$



Probl. 8 $\lim_{n \rightarrow \infty} \frac{n (-e^{-n} - 3n^2 + 4n^3 + n^2 \cos(n))}{4n^2 + 3n^4 - \sin(n^2)} = ?$ Ohne Rechner! • *Sans calculatrice!*

Probl. 9 $\left(\sum_{k=0}^{\infty} \frac{1}{2 \cdot 3^k} + \frac{1}{3 \cdot 4^k} \right) - \frac{7}{6} = ?$ Ohne Rechner! • *Sans calculatrice!*

Probl. 10 $\lim_{n \rightarrow \infty} \frac{n + 2 \ln(n)}{3n - 4 \ln(n) + 5 \tan(\frac{1}{n})} = ?$ Ohne Rechner! • *Sans calculatrice!*

Viel Glück! • *Bonne chance!*