

**Probl. 1** Diagramme? • *Diagrammes?*

(a)  $f_1(x) = \frac{x^2}{x^4 + \cos(x)^2}$ ,  $D_{f_1} = [-6, 6]$ ,  $\cos(x)^2 = (\cos(x))^2$

(b)  $f_1(x) = 0.8 \Rightarrow x = ?$

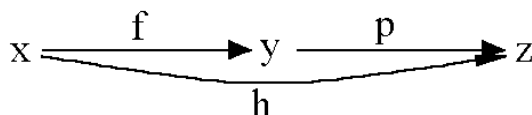
(c)  $f_2(x) = 2 \cdot \sin([x]) - x$ ,  $D_{f_2} = [-6, 6]$

(d)  $f_3(x) = \sin(|\ln(x)|)$ ,  $D_{f_3} = [-2.5, 2.5]$

**Probl. 2**  $x = 1 + \frac{1}{1 + \frac{2}{1 + \frac{1}{1 + \frac{2}{\ddots}}}} = ? \quad \rightsquigarrow \quad x \in \mathbb{Q} ?$

Ohne Rechner! • *Sans calculatrice!*

**Probl. 3**



$f(x) = \sinh(x)$   
 $p(x) = \cosh(x)$

(a)  $h(x) = (p \circ f)(x) = ?$   
 $\rightsquigarrow$  Diagramm? • *Diagramme?*

(b)  $h(x) = (f \circ p)(x) = ?$   
 $\rightsquigarrow$  Diagramm? • *Diagramme?*

(c)  $h(x) = f(p(x)^2) - 1 = ?$   
 $\rightsquigarrow$  Diagramm? • *Diagramme?*

**Probl. 4**  $f(x) = (2 - x)(4 - x^2)$ ,  $p(x) = (2 - x)^2(4 - x)$

(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**  $f(x) = \ln(1 + (\sin(x))^2)$ ,  $g(x) = 0.5x$

(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**  $2^{(6x)} = 6^x \cdot e^x \cdot 2^{-x}$  Ohne Rechner! • *Sans calculatrice!*  $x = ?$

**Probl. 7**  $(\sum_{k=1}^{\infty} \frac{e}{\pi^k}) - 1 = ?$  Ohne Rechner! • *Sans calculatrice!*

**Probl. 8**  $\lim_{n \rightarrow \infty} \frac{n^2 \cdot \sin(n) \cdot n^3 - \ln(1 - \frac{1}{n}) + n^4}{n^6 - 2n^2 + \cos(n)} = ?$  Ohne Rechner! • *Sans calculatrice!*

$\lim_{n \rightarrow \infty} \frac{n^2 \cdot \sin(n) \cdot n^2 - \ln(1 - \frac{1}{n}) + n^4}{n^5 - 2n^2 + \cos(n)} = ?$  Ohne Rechner! • *Sans calculatrice!*

**Probl. 9**  $(\sum_{k=0}^{\infty} \frac{1}{4^k} - \frac{1}{6^k}) - \frac{3}{45} = ?$  Ohne Rechner! • *Sans calculatrice!*

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

**Probl. 11**

$f_1(x) = x^2 - x - 4$ $f_2(x) = -x^2 + 2x + 8$ $g_3(x) = 4x + 10$	$f_1(x) \geq f_2(x) \rightsquigarrow L_1$ $f_1(x) \geq g_3(x) \rightsquigarrow L_2$ $\rightsquigarrow L_1 \cap L_2 = ?$ Ohne Rechner! • <i>Sans calculatrice!</i>
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Viel Glück! • *Bonne chance!*