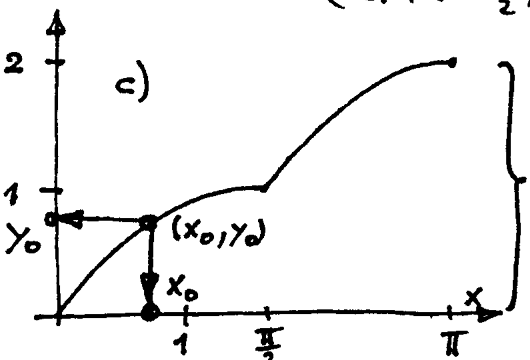
**2** $f(x) = \begin{cases} \sin(x) & x \in (0, \frac{\pi}{2}) \\ \sin(x - \frac{\pi}{2}) + 1 & x \in [\frac{\pi}{2}, \pi] \end{cases}$

c)




a) $W_f = (0, 2]$

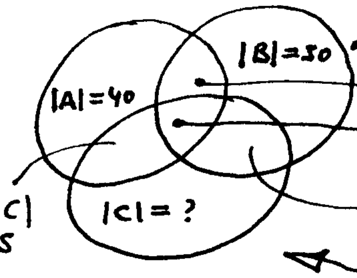
a) $\mathcal{D}_f = (0, \pi]$

b) $\forall_{x_0 \in \mathcal{D}_f} \; x_0 \longleftrightarrow y_0$ <u>bij.</u>

( $x_0 \longleftrightarrow y_0$ eideut. • univoque)

**3**

a)




$|A \cup B \cup C| = 125$

$|A \cap B| = 10$

$|A \cap B \cap C| = 10 = |A \cap B|$

$|B \cap C| = 20$

$|A \cap C| = 15$

$\{\}$

$A \cap B \cap C = A \cap B$

<u>O.k.</u> !

$|A \cup B \cup C| = |A| + |B| + |C| - |A \cap B| - |A \cap C| - |B \cap C| + |A \cap B \cap C|$

$125 = 40 + 50 + |C| - \cancel{10} - 15 - 20 + \cancel{10}$

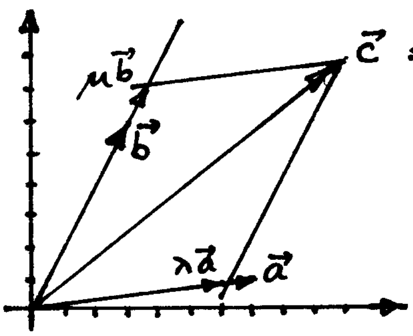
$\Rightarrow |C| = \underline{\underline{70}}$

b) $|A \cap B| = 10 < |A \cap B \cap C| = 1 \Longrightarrow$ <u>Widerspruch Contradiction</u>

<u>Keine Lösung! • Pas de solution!</u>

**4**

a) 1)




$\vec{c} = \lambda \vec{a} + \mu \vec{b}$ $\rightsquigarrow$ a) 2) $\binom{10}{8} = \lambda \binom{7}{1} + \mu \binom{3}{6}$

$\Rightarrow \begin{array}{ll} \text{I} & 7\lambda + 3\mu = 10 \\ \text{II} & \lambda + 6\mu = 8 \end{array}$

$\text{II} - 2 \cdot \text{I}: \quad -13\lambda + \cancel{0\mu} = 8 - 20 = -12$

$\Rightarrow \lambda = \frac{12}{13}$

$\text{II}: \quad \mu = \frac{8 - \lambda}{6} = \frac{1}{6} \cdot \left(8 - \frac{12}{13}\right) = \frac{1}{6}\left(\frac{104 - 12}{13}\right) = \frac{\cancel{92}^{46}}{\cancel{6}_3 \cdot 13} = \frac{46}{39} \Rightarrow (\lambda, \mu) = \left(\frac{12}{13}, \frac{46}{39}\right)$

$\underline{\underline{\approx (0.92, 1.18)}}$

b) $\vec{c} = \sqrt{10^2 + 8^2} = \underline{\underline{\sqrt{164}}} \approx 12{,}81$

c) $\underline{\underline{\vec{c}_{\{\vec{a}, \vec{b}\}} = \begin{pmatrix} 12/13 \\ 46/39 \end{pmatrix} \approx \begin{pmatrix} 0.92 \\ 1.18 \end{pmatrix}}}$ (vgl. a) • voir a)) $\left(\vec{c}_{\{\vec{a}, \vec{b}\}} = \binom{\lambda}{\mu}\right)$