Hello, problems? ask them.

At Monday there is also a possibility to question me about the escercises or theory,

<u>René</u> Monday:

$\pm$ 17.45 – 19.15 hour.

If there are a lot of questions then 20.00 hour?

These notes will be put at my homepage:

www.win.tue.nl/~rvhassel

<u>Pg 29, def:</u>

(i) ... $\begin{pmatrix} 0 \cdots 0 & 1 & \cdots \\ & & \end{pmatrix}$

$$
\text{(ii)}\quad
\begin{array}{c}
k \\ k+1
\end{array}
\begin{pmatrix}
0 \cdots 0 & 1 & 2 & 0 & 4 \\
0 \cdots 0 & 2 & \cdots & & \cdots
\end{pmatrix}
$$

$$
\begin{pmatrix}
0 \cdots 0 & 1 & \cdots\cdots & & \\
0 \cdots\cdots & 0 & 1 & \cdots\cdots & \\
0 & \cdots & \cdots & \cdots & 0
\end{pmatrix}
$$

$$
\begin{pmatrix}
- \cdots & 1 & \cdots & & \cdots \\
 & 0 & & & \\
\cdots 0 \cdots & \vdots & \cdots 0 & 1 & \\
 & \vdots & & 0 & \\
 & 0 & & 0 &
\end{pmatrix}
$$

(1.1) (g)

$m_1 \neq m_2$

$$
\left(\begin{array}{cc|c}
-m_1 & 1 & l_1 \\
-m_2 & 1 & l_2
\end{array}\right)
$$

(a) Stel mét ($m_1 \neq m_2$)

$m_1 = m_2$

$$\left(\begin{array}{cc|c} -m_1 & 1 & \ell_1 \\ -m_1 & 1 & \ell_2 \end{array}\right)$$

-1

$$\left(\begin{array}{cc|c} 0 & 0 & \underbrace{(\ell_2 - \ell_1)} \end{array}\right)$$

geen opl $\quad \ell_2 - \ell_1 \neq 0$

$(\ell_1 = \ell_2)$

$$\begin{array}{cc|c} -m_1 & 1 & \ell_1 \end{array}$$

$$-m_1 x_1 + x_2 = \ell_1$$

$$x_2 = \ell_1 + m_1 \cdot x_1$$

$$\begin{pmatrix} x_1 \\ x_2 \end{pmatrix} = \begin{pmatrix} 0 + 1 \cdot x_1 \\ \ell_1 + m_1 \cdot x_1 \end{pmatrix}$$

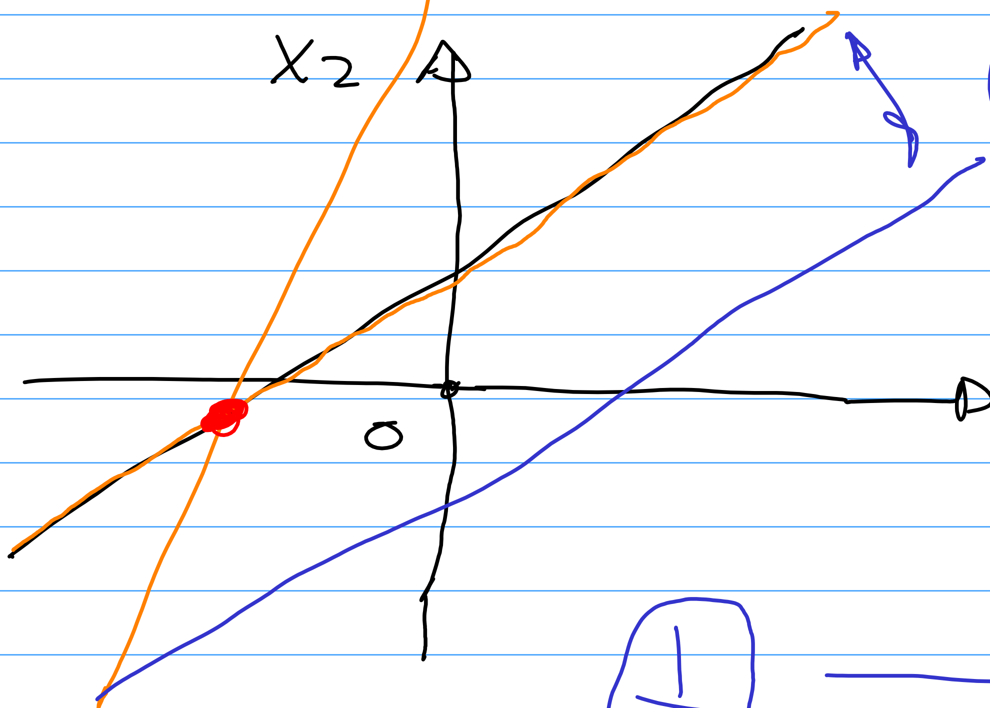
$$= \begin{pmatrix} 0 \\ \ell_1 \end{pmatrix} + x_1 \begin{pmatrix} 1 \\ m_1 \end{pmatrix}$$

$\leadsto$ veel opl. $\quad x_1 \in \mathbb{R}$

$m_1 \neq m_2$

$$-m_1 x_1 + x_2 = l_1$$

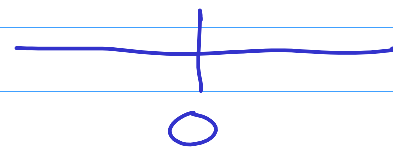
meetkundig:



$m_1 = m_2$

$l_1 \neq l_2$

$\underline{m_1 \neq m_2}$ $\leadsto$ $\frac{1}{m_1}$



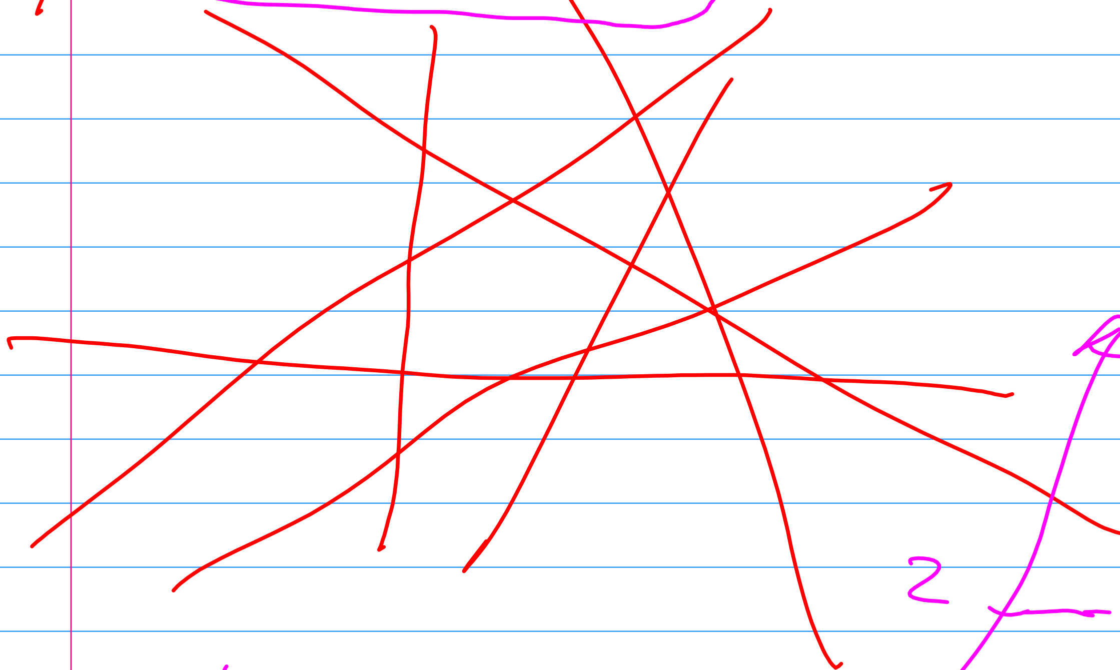
$(m_1 \neq 0)$

$$\begin{cases} -m_1 x_1 + 1 \cdot x_2 = l_1 \\ -m_2 \cdot x_1 + 1 \cdot x_2 = l_2 \end{cases}$$

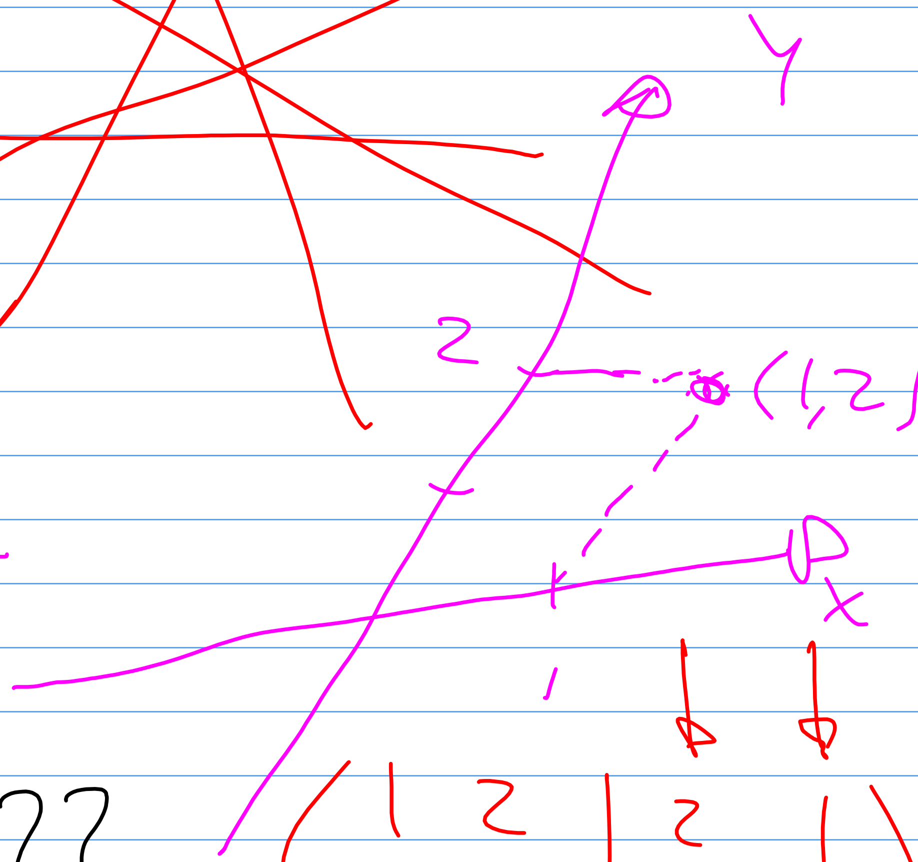
$$\underbrace{(-m_2 + m_1)}\, x_1 = (l_2 - l_1)$$

a) $\underline{m_1 \neq m_2}$ $\quad -m_2 + m_1 \neq 0$

$\{ m_1 \cdot m_2 = -1$? dan loodrecht $\}$



$(1, 2)$



$(1, 2, 11)$??

$$\left(\begin{array}{cc|cc} 1 & 2 & 2 & 1 \\ 3 & 7 & 8 & 8 \end{array}\right)$$

$$\left(\begin{array}{cc|c} 1 & 2 & 2 \\ 3 & 7 & 8 \end{array}\right) \qquad \left(\begin{array}{cc|c} 1 & 2 & 1 \\ 3 & 7 & 8 \end{array}\right)$$

-3 $\qquad$ -3

(1.3) skew symm:

$$\boxed{A^T = -A}$$ (wikipedia) → (A $\underline{n \times n}$)

$$A = \underbrace{\frac{(A + A^T)}{2}}_{\text{symm}} + \underbrace{\frac{(A - A^T)}{2}}_{\text{(scheef symm)}}$$

A $\underline{(n \times n)}$

$$(A - A^T)^T = A^T - A = -(A - A^T)$$

$A + A^T$ bestaat deze??

$$\left(A + A^T \right)$$

$$\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}^T = \begin{pmatrix} 0 & 1 \\ -1 & 1 \end{pmatrix} \neq -\begin{pmatrix} 0 & -1 \\ 1 & 1 \end{pmatrix}$$

$$\begin{pmatrix} 0 & 1 & -4 \\ -1 & 0 & -1 \\ 4 & 1 & 6 \end{pmatrix}$$

a_{12}

a_{21} $\quad a_{ij} \quad (= -a_{ji})$

rij kolom

$$\begin{vmatrix} 1 & 0 \\ 0 & 1 \end{vmatrix} = 1$$

$$\begin{vmatrix} 0 & 1 \\ 1 & 0 \end{vmatrix} = -1$$

$$\begin{vmatrix} -3 & 2 & 1 \\ 4 & 3 & 2 \\ 1 & 2 & 5 \end{vmatrix} =$$

$$(-1).(-1).\begin{vmatrix} 1 & 2 & 5 \\ -3 & 2 & 1 \\ 4 & 3 & 2 \end{vmatrix} =$$

3

-4

$$\begin{vmatrix} 1 & 2 & 5 \\ 0 & 8 & 16 \\ 0 & -5 & -18 \end{vmatrix} =$$

$$(-1)\,8\cdot\begin{vmatrix}1 & 2 & 5\\ 0 & 1 & 2\\ 0+5 & +18 & \end{vmatrix} = \; -5$$

$$-8\cdot\begin{vmatrix}1 & 2 & 5\\ 0 & 1 & 2\\ 0 & 0 & 8\end{vmatrix}$$

$$-8\cdot1\cdot1\cdot8 = \underline{\underline{-64}}$$

<u>www.win.tue.nl/~wharsel</u>

<u>(1.3.12)</u>

$A\,\underline{x}$

$$3\ \boxed{a_1\ a_2\ a_3\ a_4}\ x = \begin{pmatrix} l \end{pmatrix}$$ rij x Kolom

$$x = \begin{pmatrix} x_1 \\ \vdots \\ x_4 \end{pmatrix}$$ 4

<u>R.K</u>

$$b = \underline{a_1 + a_2 + a_3 + a_4}$$

1 . 1e kol +

1 . 2e kol +

1 . 3e k + 1 . 4e kol

$$\begin{pmatrix} \underline{a}_1 & \cdots & \underline{a}_4 \end{pmatrix} \begin{pmatrix} x_1 \\ \vdots \\ x_4 \end{pmatrix} =$$

$$x_1 \underline{a}_1 + x_2 \cdot \underline{a}_2 + x_3 \underline{a}_3 + x_4 \underline{a}_4$$

$$x = \begin{pmatrix} 1 \\ 1 \\ 1 \\ 1 \end{pmatrix}$$ een oplossing

enige opl ?? nee, waarom ?

$$\begin{array}{c|cccc} & x_1 & x_2 & x_3 & x_4 \\ \hline & 1 & & & \\ 3 & 0 & 1 & & \\ & 0 & 0 & 1 & \end{array}$$

$\boxed{x_4 \text{ vrij}}$ → meer opl

$$\left(\begin{array}{ccc|c} 1 & 1 & 2 & 4 \\ 0 & 2 & 1 & 3 \end{array}\right) \qquad x = \begin{pmatrix} 1 \\ 1 \\ 1 \end{pmatrix}$$

$$\left(\begin{array}{ccc|c} 1 & 0 & \frac{3}{2} & \frac{5}{2} \\ 0 & 2 & 1 & 3 \end{array}\right)$$

dus meerdere oplossingen.

<u>x_3 is vrij</u>

(website?? <u>Krijg niet opgestart</u>)
(gewoon alles op website)

$(1, 3)(g)$

$$A \cdot \underline{x} = \underline{b}$$

$$\begin{pmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{pmatrix} \begin{pmatrix} x_1 \\ x_2 \end{pmatrix} =$$

$$\begin{pmatrix} a_{11} \cdot \underline{\underline{x_1}} + a_{12} \cdot \underline{\underline{x_2}} \\ a_{21} \cdot \underline{\underline{x_1}} + a_{22} \cdot \underline{\underline{x_2}} \end{pmatrix} =$$

$$x_1 \begin{pmatrix} a_{11} \\ a_{21} \end{pmatrix} + x_2 \begin{pmatrix} a_{12} \\ a_{22} \end{pmatrix}$$

(1.9) a)

$$A = \begin{pmatrix} 1 & 2 \\ 1 & -2 \end{pmatrix} \qquad \underline{b} = \begin{pmatrix} 4 \\ 0 \end{pmatrix}$$

$$x_1 \cdot \begin{pmatrix} 1 \\ 1 \end{pmatrix} + x_2 \begin{pmatrix} 2 \\ -2 \end{pmatrix} = \begin{pmatrix} 4 \\ 0 \end{pmatrix}$$

$$\underline{x_1 = 2, \; x_2 = 1}$$

$$-1 \quad \left(\begin{array}{cc|c} 1 & 2 & 4 \\ 1 & -2 & 0 \end{array}\right)$$

$$\left(\begin{array}{cc|c} 1 & 2 & 4 \\ 0 & +1 & +1 \end{array}\right) \; -2$$

$$\begin{array}{cc} x_1 & x_2 \end{array}$$

$$\left(\begin{array}{cc|c} 1 & 0 & 2 \\ 0 & 1 & 1 \end{array}\right) \qquad x_1 = 2, \quad \underline{x_2 = 1}$$

(na instructie ga ik
website repareren!)

(index.html ??)
(/~ vvhassel)

!

Trouwens:

/~ vvhassel/Onderwijs/ (O)

doet het wel!

Maandag instructies!
17.45 uur ~~tot~~ 20.00 uur ??