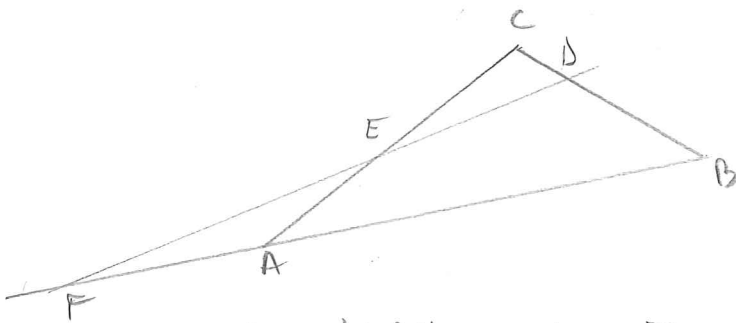


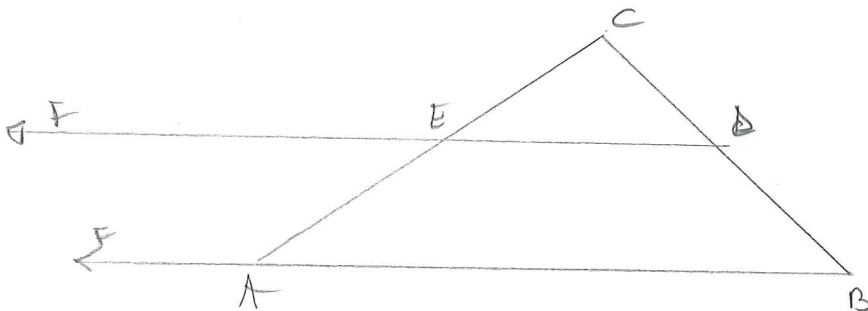


$$\lim_{P \rightarrow \infty} \frac{\overline{AP}}{\overline{PB}} = -1.$$

Menelaos setning



Grensetilfelle når $F \rightarrow \infty$



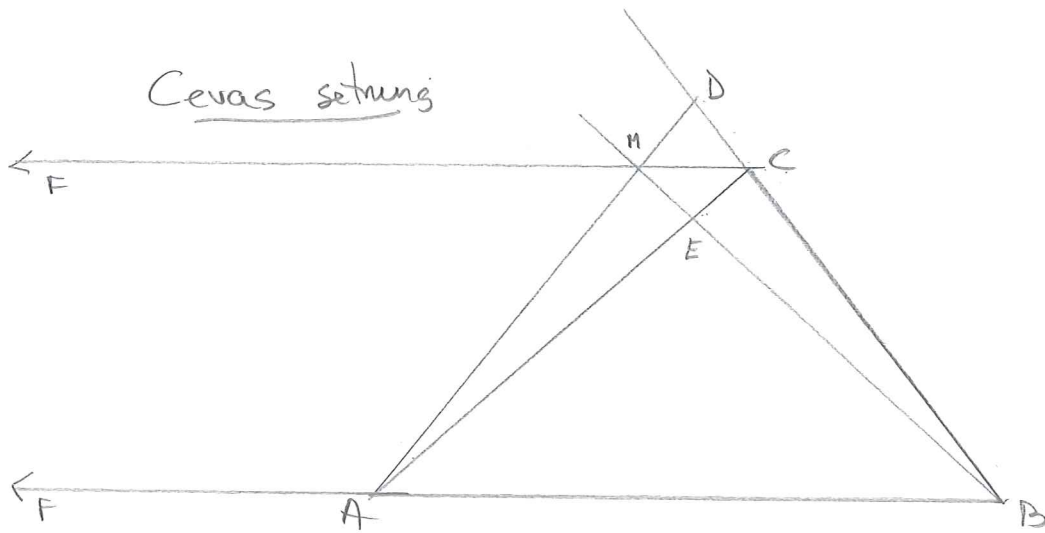
Oppgave: Bruk formelutledning til å vise at

$$\frac{BD}{DC} \cdot \frac{CE}{EA} = 1.$$

Siden $\frac{\overline{AF}}{\overline{FB}} = -1$ når $F \rightarrow \infty$ får vi

$$\frac{\overline{AF}}{\overline{FB}} \cdot \frac{BD}{DC} \cdot \frac{CE}{EA} = -1. \quad \text{Menelaos}$$

Ceva's setting



$$\frac{BD}{DC} \cdot \frac{CE}{EA} = -1$$

Beis.

$$\triangle MDC \sim \triangle ADB$$

or

$$\triangle AEB \sim \triangle CEM$$

$\Rightarrow$

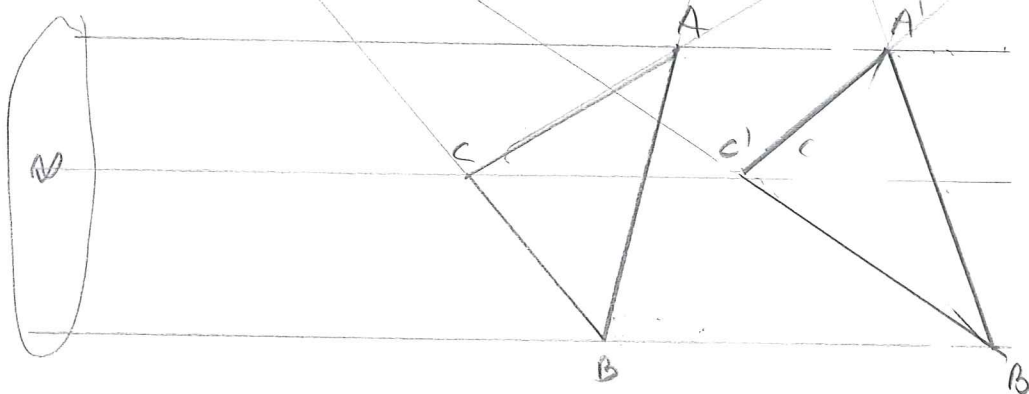
$$\frac{BD}{DC} = \frac{AB}{CM}$$

$$\frac{CE}{AE} = \frac{CM}{AB}$$

or

$$\Rightarrow \frac{BD}{DC} \cdot \frac{CE}{EA} = \frac{AB}{CM} \cdot \frac{CM}{AB} = 1$$

Desargues setting



$$v u(A - A') = v t(C - C') = v s(B - B')$$

$$s \neq t$$

• Origin

$$\text{Velg } v \text{ slikt at } v u + v s = 1 \Rightarrow v u A - v s B = v u A' - v s B'$$

$$x A + (1-x) B$$

$$v = \frac{1}{u-s}$$

$$A + (v u - 1) A - v s B$$

$$A + v s A - v s B$$

$$A + v s(A - B) = A' + v s(A' - B') \in AB \cap A'B'$$

$$A + vS(A-B) = A + \frac{S}{u-S}(A-B) = \frac{(u-S)A + S(A-B)}{u-S} = \frac{uA - SB}{u-S}$$

$$\Rightarrow (u-S) \frac{uA - SB}{u-S} - (u-t) \frac{uA - tC}{u-t} + (S-t) \frac{SB - tC}{S-t} \\ = uA - SB - uA + tC + SB - tC = 0.$$

$\Rightarrow$ Punktene ligger på linje.

$$\mathbb{P}^2 = \{ (x:y:z) \mid (x,y,z) \neq (0,0,0) \}.$$

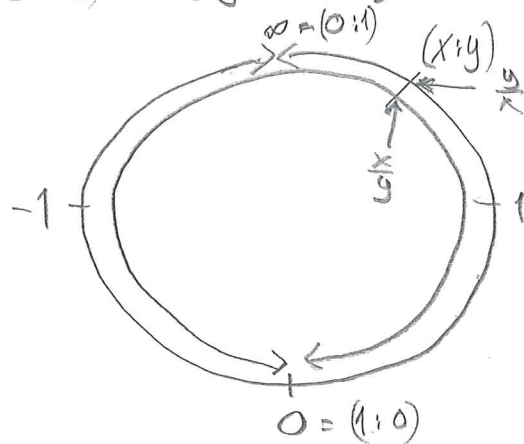
$$x \neq 0: \{ (1,y,z) \} = \mathbb{R}^2$$

$$y \neq 0: \{ (x,1,z) \} = \mathbb{R}^2$$

$$z \neq 0: \{ (x,y,1) \} = \mathbb{R}^2$$

$\mathbb{P}^2$ dekkes av
ulike $\mathbb{R}^2$.

$$\mathbb{P}^1: \{ (x:y) \mid (x,y) \neq (0,0) \}$$



$\mathbb{P}^1$ dekkes av to $\mathbb{R}^1$

$$\{ (x:y) \mid x \neq 0 \} = \{ (1, \frac{y}{x}) \} \cong \mathbb{R} \frac{y}{x}$$

$$\{ (x:y) \mid y \neq 0 \} = \{ (\frac{x}{y}, 1) \} \cong \mathbb{R} \frac{x}{y}$$

Standardoppgave:

Gitt to linjer $x_0 - 2x_1 + 3x_2 = 0$ og $3x_0 + x_1 + 4x_2 = 0$
i det projektive planet $\mathbb{P}^2$. Finn skjæringspunktet

$$\text{Svar: } \begin{vmatrix} \bar{l} & \bar{j} & \bar{h} \\ 1 & -2 & 3 \\ 3 & 1 & 4 \end{vmatrix} = \underline{\underline{(-11:5:7)}}$$

Gitt to punkter $(0:1:0)$ og $(-11:5:7)$ i $\mathbb{P}^2$. Finn linja gjennom punktene

$$\text{Svar: } \begin{vmatrix} x_0 & x_1 & x_2 \\ 0 & 1 & 0 \\ -11 & 5 & 7 \end{vmatrix} = \underline{\underline{7x_0 + 11x_2 = 0}}$$