MAT 2500 17.11.2020

E 2011 - 4

$\mathbb{P}^2$ $A = (1:0:0)$ $\quad l_0 = L_{BC} : x_0 = 0$

$B = (0:1:0)$ $\quad l_1 = L_{AC} : x_1 = 0$

$C = (0:0:1)$ $\quad l_2 = L_{AB} : x_2 = 0$

Anta $P, Q, R \neq A, B, C$

$P \in l_0$ $\quad P = (0 : 1 : a)$ for $a \neq 0$ $(a = 0 \Rightarrow P = B)$

$[(0 : \hat{a} : 1)$ for $\hat{a} \neq 0$ $(\hat{a} = 0 \Rightarrow P = C)]$

$Q \in l_1$ $\quad Q = (b : 0 : 1)$ for $b \neq 0$ $(b = 0 \Rightarrow Q = C)$

$[(1 : 0 : \hat{b})]$

$R \in l_2$ $\quad R = (1 : c : 0)$ for $c \neq 0$ $(c = 0 \Rightarrow R = A)$

$$P, Q, R \in L \iff \begin{vmatrix} 0 & 1 & a \\ b & 0 & 1 \\ 1 & c & 0 \end{vmatrix} = 0$$

$$= -1(-1) + a \cdot b \cdot c = 0$$

$$abc = -1$$

Hvis $abc = -1$, så vil P, Q, R ligge på linje.

20 - 1 b) $A = 0 \quad B = 3 \quad C = 2$

$$(A, B; C, D) = -1 = \frac{(C-A)(B-D)}{(B-C)(D-A)}$$

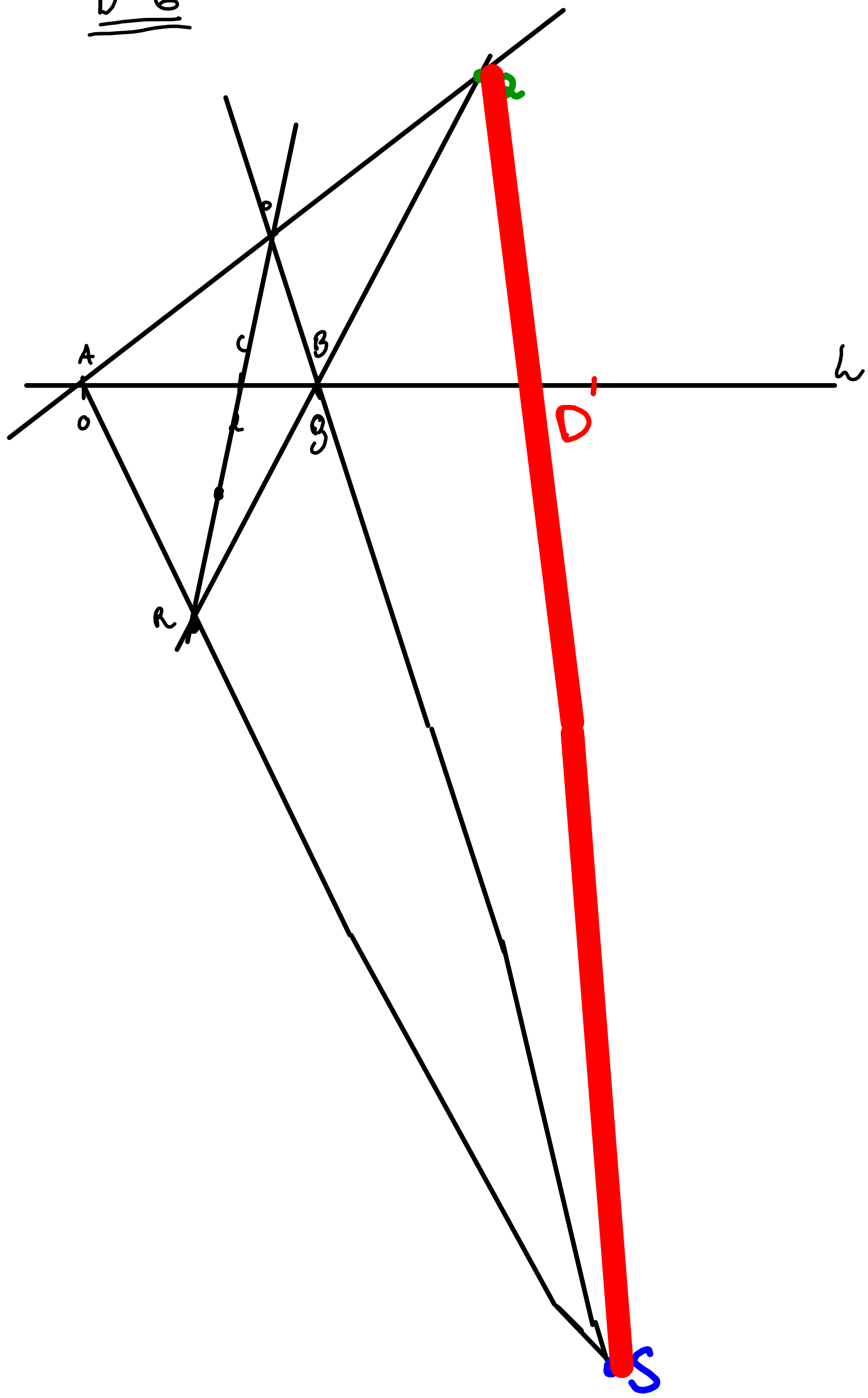
$C - A = 2$
$B - D = 3 - d$
$B - C = 3 - 2 = 1$
$D - A = d$

$$\frac{2 \cdot (3-d)}{1 \cdot d} = -1$$

$6 - 2d = -d$

$\underline{\underline{d = 6}}$

$\underline{\underline{D = 6}}$



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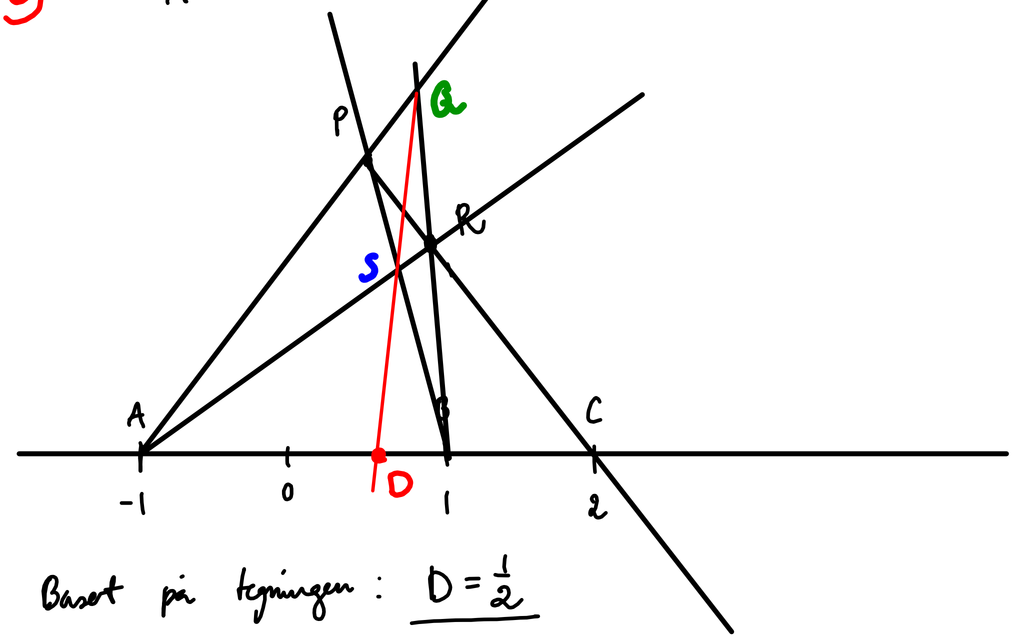
$A = -1 \quad B = 1 \quad C = 2$



Basert på tegningen : $\underline{D = \frac{1}{2}}$

$C - A = 2 - (-1) = 3$
$B - D = 1 - d$
$B - C = 1 - 2 = -1$
$D - A = d - (-1) = d + 1$

$$-1 = \frac{3 \cdot (1-d)}{-1(d+1)}$$

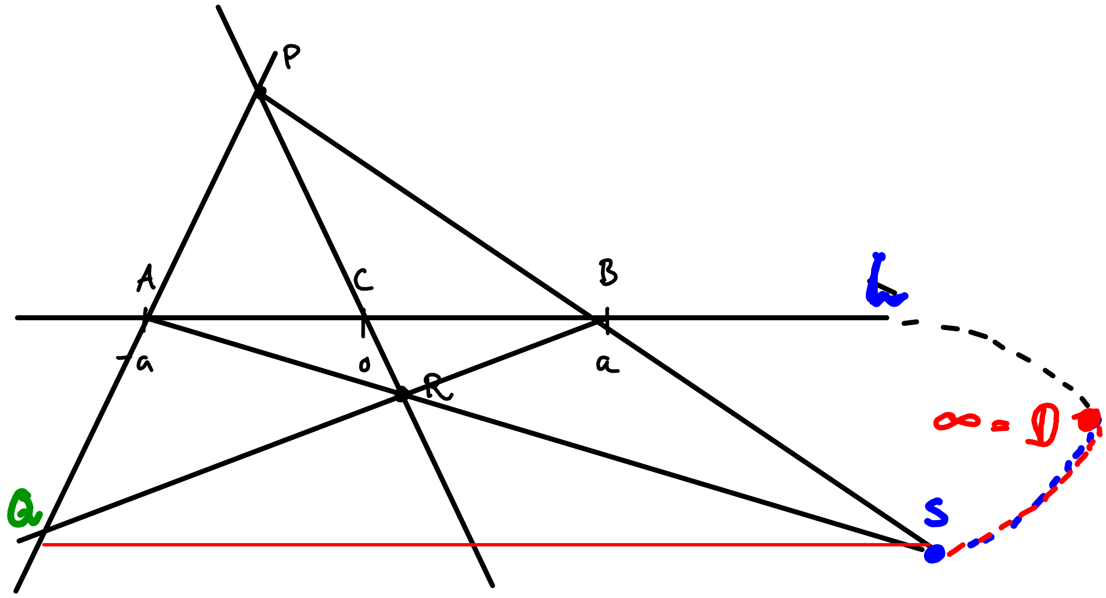
$$d + 1 = 3 - 3d$$

$$4d = 2$$

$$\underline{d = \frac{1}{2}}$$

$$\underline{D = \frac{1}{2}}$$

1 a) $A = -a \quad B = a \quad C = 0 \quad , \quad a > 0$



$C - A = 0 - (-a) = a$

$B - D = a - d$

$B - C = a - 0 = a$

$D - A = d - (-a) = d + a$

$$-1 = \frac{\cancel{a}(a-d)}{\cancel{a}(d+a)}$$

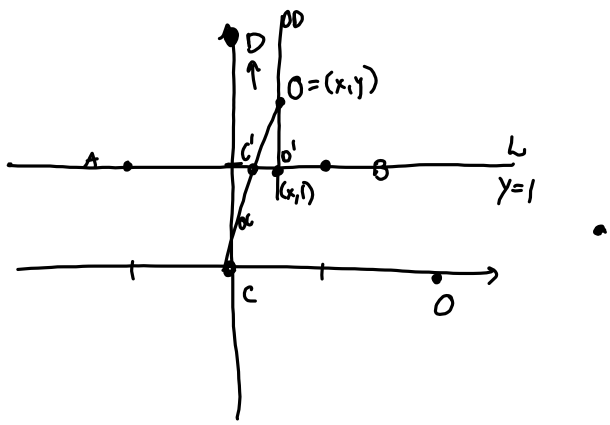
$-d - a = a - d$

$\underline{a = 0}$

$d = \infty \qquad \underline{-1 = \frac{-\infty}{\infty}}$ per definisjon

2

$A = (-1:1:1)$
$B = (1:1:1)$
$C = (0:0:1)$
$D = (0:1:0)$



$L: y=1 \rightsquigarrow x_1 - x_2 = 0$

$D' = (x:1:1)$

$$v_{D'} = OD \cap L$$
$$= ((x,y,1)\times(0,1,0)) \times (0,1,-1)$$
$$= (-1,0,x) \times (0,1,-1)$$
$$= (-x,-1,-1)$$

$D' = (x:1:1)$

C': $$v_{C'} = OC \cap L$$
$$= ((x,y,1)\times(0,0,1)) \times (0,1,-1)$$
$$= (y,-x,0)\times(0,1,-1)$$
$$= (x,y,y)$$

$y \neq 0 \quad C' = \left(\frac{x}{y} : 1 : 1\right)$

$$\boxed{\begin{array}{l} y=0 \\ C' = \infty \end{array}}$$

$(A,B;C',D') = -1$

$C' - A = \frac{x}{y} - (-1) = \frac{x}{y} + 1$

$B - D' = 1 - x$

$B - C' = 1 - \frac{x}{y}$

$D' - A = x - (-1) = x + 1$

$$-1 = \frac{\left(\frac{x}{y}+1\right)(1-x)}{\left(1-\frac{x}{y}\right)(x+1)}$$

$$\left(\frac{x}{y}-1\right)(x+1) = \left(\frac{x}{y}+1\right)(1-x)$$

$$\frac{x^2}{y} + \frac{x}{y} - x - 1 = \frac{x}{y} - \frac{x^2}{y} + 1 - x$$

$$\frac{2x^2}{y} = 2$$

$$\boxed{x^2 = y}$$

Standard parabel