Diagram labels: (X_{2p}, Y_{2p}), (X_2, Y_2), (X_{p2}, Y_{p2}), (X, Y), (X_{int}, Y_{int}), (X_{p1}, Y_{p1}), dx_m, dx_n, (X_1, Y_1), $dx_1 = dy_m$, $dy_1 = -dx_m$, (X_{1p}, Y_{1p})

$$y = a x_1 + b_1$$

CCW:

$$\begin{cases} dx_1 = dy_m \\ dy_1 = -dx_m \end{cases}$$

straight lines :

$$\begin{cases} a_1 = \dfrac{Y_{p1} - Y_{1p}}{X_{p1} - X_{1p}} \\[2mm] b_1 = Y_{p1} - a_1 X_{p1} \end{cases}$$

intersection :

$$Y_{int} = a_1 X_{int} + b_1 = a_2 X_{int} + b_2$$
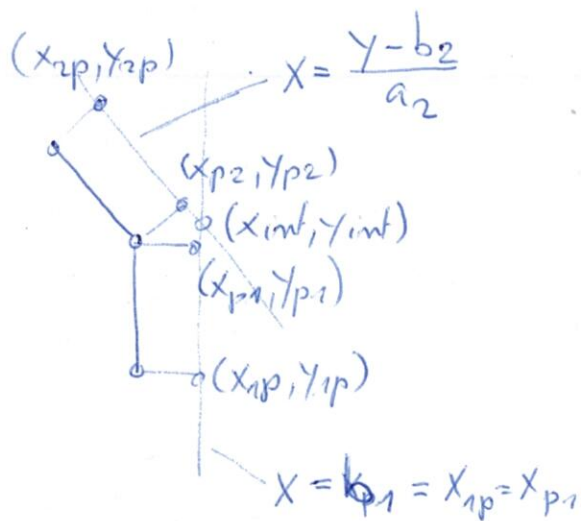
$$(a_1 - a_2) X_{int} = b_2 - b_1$$

$$X_{int} = \frac{Y_{int} - b_1}{a_1} = \frac{Y_{int} - b_2}{a_2}$$

$$a_2 (Y_{int} - b_1) = a_1 (Y_{int} - b_2)$$

$$(a_2 - a_1) Y_{int} = a_2 b_1 - a_1 b_2$$

$$\begin{cases} X_{int} = \dfrac{b_2 - b_1}{a_1 - a_2} \\[3mm] Y_{int} = \dfrac{a_2 b_1 - a_1 b_2}{a_2 - a_1} \end{cases}$$
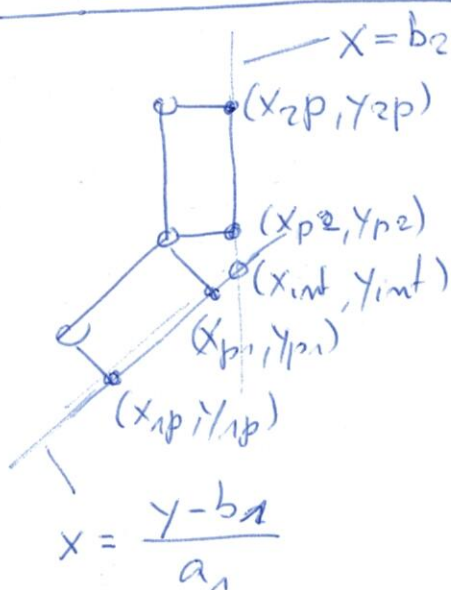
first line vertical

(x_{2p}, y_{2p}) $X = \dfrac{y - b_2}{a_2}$

(x_{p2}, y_{p2})

(x_{int}, y_{int})

(x_{p1}, y_{p1})

(x_{1p}, y_{1p})

$X = b_1 = x_{1p} = x_{p1}$

$b_1 = \dfrac{y_{int} - b_2}{a_2}$

$\begin{cases} y_{int} = a_2 b_1 + b_2 \\ x_{int} = b_1 \end{cases}$

second line vertical

$X = b_2$

(x_{2p}, y_{2p})

(x_{p2}, y_{p2})

(x_{int}, y_{int})

(x_{p1}, y_{p1})

(x_{1p}, y_{1p})

$X = \dfrac{y - b_1}{a_1}$

$b_2 = \dfrac{y_{int} - b_1}{a_1}$

$\begin{cases} y_{int} = a_1 b_2 + b_2 \\ x_{int} = b_2 \end{cases}$