

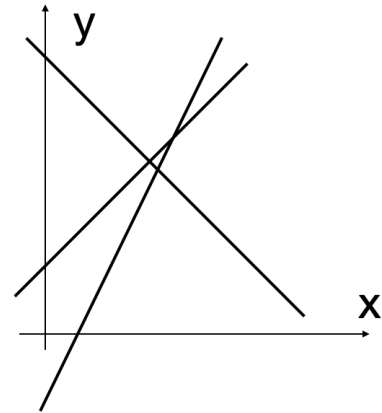
## Homework 8

1. *Optional (5 points)*. Find the approximate intersection of three lines defined by the following equations:

$$y = x + 1$$

$$y = 4 - x$$

$$y = 2x - 1$$



2. *Optional (5 points)*. Find the equation of the line that comes as near as possible to all the vectors below:

[ 19, 43, 25 ], [ 9, 21, 15 ], [ 12, 29, 18 ], [ 21, 46, 27 ], [-4, -4, 2 ],

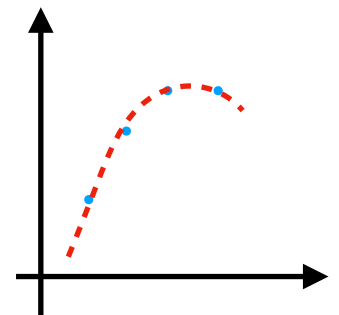
[ 24, 51, 30 ], [ 5, 14, 11 ]

3. *Optional (10 points)*. There are five 4D vectors:

[1, 3, 5, 7], [-1, 2, -3, 0], [0, 1, 1, -1], [0, 2, 1, 1], [-2, 4, -5, 4]

Find a 2D plane, so all these vectors almost belong to it.

4. *Optional (5 points)*. We know that function  $y = f(x)$  is a second-order polynomial. We have got several measurements in the form of a list of pairs  $(x, y)$ :
- (1, 2), (2, 4), (3, 5), (4, 5).



Find the parameters  $a$ ,  $b$ , and  $c$  of function  $f(x) = ax^2 + bx + c$   
*that fit the given measurements the best.*