Q5.

let x_1 = the # of hours used in dept 1

let x_2 = the # of hours used in dept 2

let y = # of assembled products

$x_1 \leqslant 100$ → # of hours available in dept 1

$x_2 \leqslant 110$ → # of hours available in dept 2

$1050 \leqslant y \leqslant 1200$ → range of assembled products

- we need at least y of each part's units

$7x_1 + 6x_2 \geqslant y$ → part 1 units

$6x_1 + 11x_2 \geqslant y$ → part 2 units

$9x_1 + 5x_2 \geqslant y$ → part 3 units

- the total # of types produced in all parts =

$(7x_1 + 6x_2) + (6x_1 + 11x_2) + (9x_1 + 5x_2) =$

$22x_1 + 22x_2$

we produce y assembled products for each part

so the constraint regarding the storage space

$22x_1 + 22x_2 - 3y \leqslant 200$

find LP:

min
$$25x_1 + 12.5x_2 + 0y$$

s/t
$$x_1 \leqslant 100$$
$$x_2 \leqslant 110$$
$$1050 \leqslant y \leqslant 1200$$
$$7x_1 + 6x_2 \geqslant y$$
$$6x_1 + 11x_2 \geqslant y$$
$$9x_1 + 5x_2 \geqslant y$$
$$22x_1 + 22x_2 - 3y \leqslant 200$$
$$x_1, x_2, y \geqslant 0$$