

Q4: (a)  $\frac{1}{f} x + y \geq [b]$

$$2x_1 + y_1 \geq 3 \quad 2x_1 + 4x_2 + 3y_1 + y_2 \geq 1$$

$$15x_2 + y_2 \geq 2.$$

minimize this

(b) Find  $(\bar{x}, \bar{y})$  that

(i)  $2\bar{x}_1 + 4\bar{x}_2 + 3\bar{y}_1 + \bar{y}_2 < 9$

(ii)  $2\bar{x}_1 + \bar{y}_1 \geq 3 \quad 15\bar{x}_2 + \bar{y}_2 \geq 2$

$$\bar{x}_1 + \bar{y}_1 \geq 2.5$$

$$\bar{x}_1 + 2\bar{x}_2 + 3\bar{y}_1 + \bar{y}_2 \geq 8.5$$

$$3\bar{x}_2 + \bar{y}_2 \geq 1.2$$

$$\bar{x}, \bar{y} \geq 0$$

subject to these constraints.

Soln:  $\bar{x} = \left(\frac{49}{150}, \frac{1}{15}\right), \bar{y} = \left(2\frac{26}{75}, 1\right)$

Value:  $2\bar{x}_1 + 4\bar{x}_2 + 3\bar{y}_1 + \bar{y}_2$

$$= 8.96 = 8\frac{24}{25}$$

$$< 9.$$