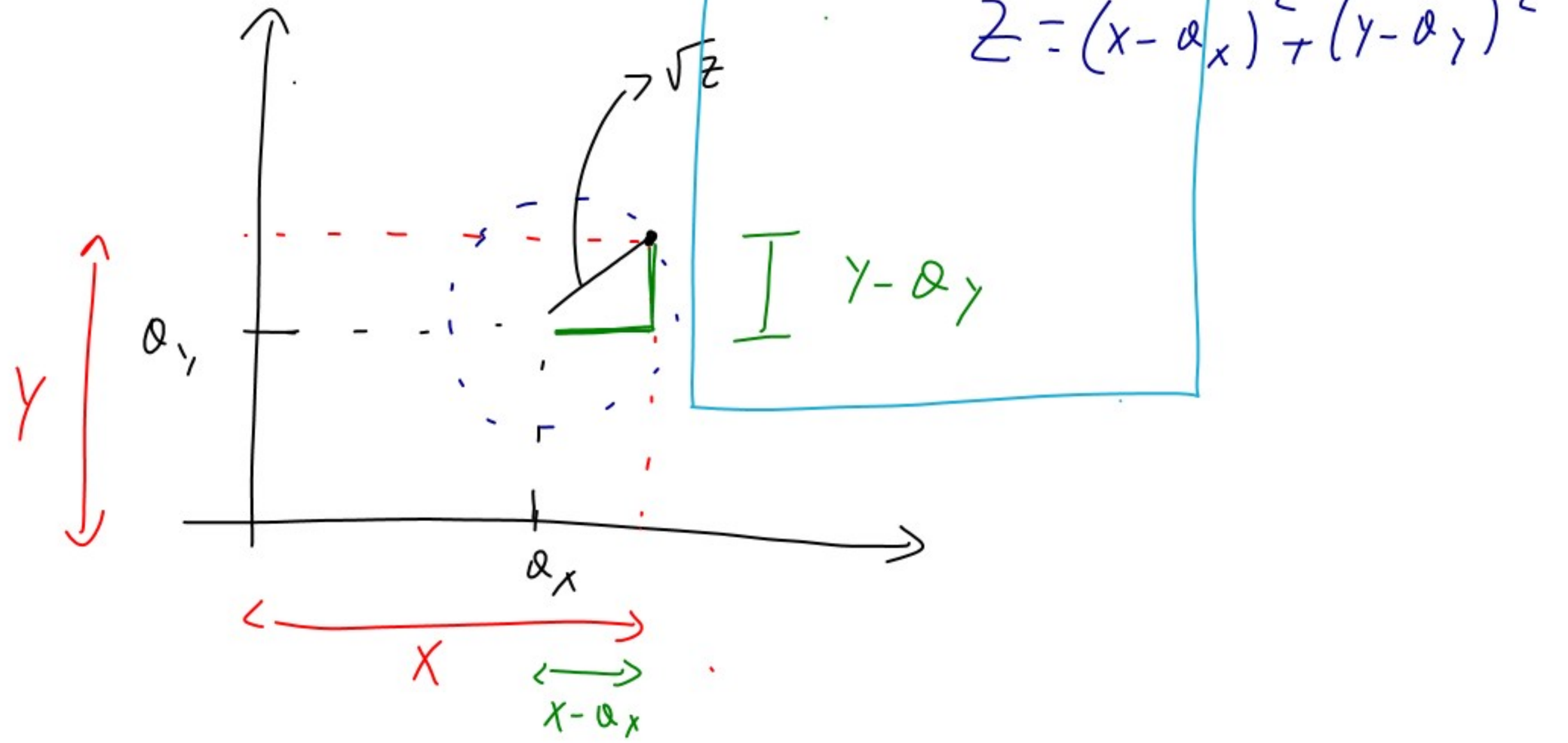
(3) $X \leq 10$

(4) $Y \leq 10$

(1) $X \geq 4$

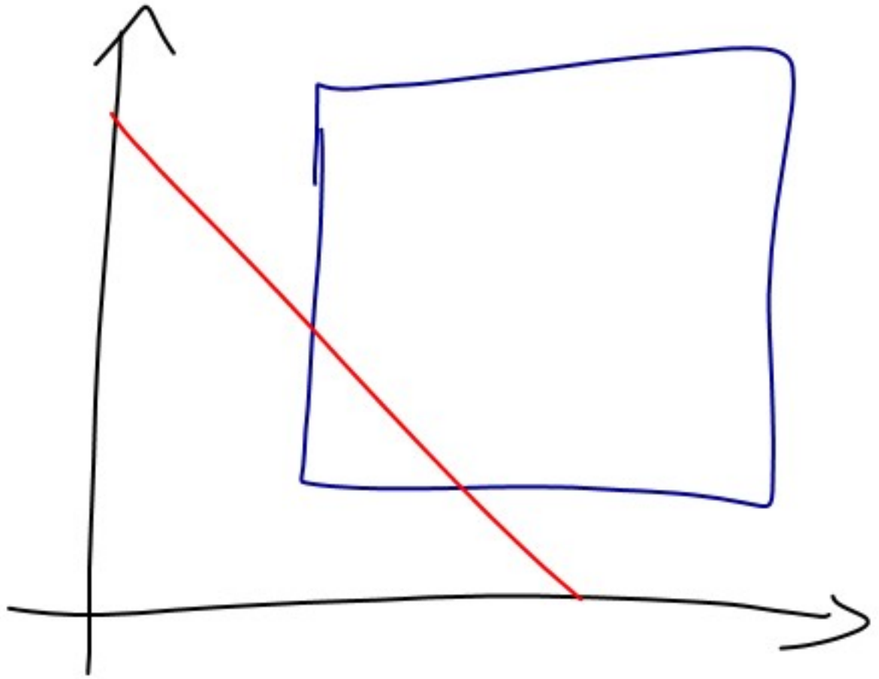
(2) $Y \geq 4$



$x \geq 4$ $\quad f(x^*, y^*)$

$x \geq 3.9 \longrightarrow f(x^-, y^-) - 1.5(\Delta)$

$\gamma = -1.5$



$$\max_{\{x,y\}} ax + by \quad \text{s.a.} \quad p_x x + p_y y = I$$

$$-x \le 0$$
$$-y \le 0$$

(1) $a = \lambda p_x - \gamma_1$

(2) $b = \lambda p_y - \gamma_2$

(3) $\gamma_1 \ge 0$, (4) $\gamma_2 \ge 0$

(5) $\gamma_1 x = 0$ (6) $\gamma_2 y = 0$

(7) $x \ge 0$ (8) $y \ge 0$

(9) $I = p_x x + p_y y$

$$\frac{\partial (ax+by)}{\partial y} = \lambda \frac{\partial (p_x x + p_y y - I)}{\partial y} + \gamma_1 \frac{\partial (-x)}{\partial y} + \gamma_2 \frac{\partial (-y)}{\partial y}$$

(A) $\gamma_1 > 0, \gamma_2 > 0$

$\downarrow 5$ $\downarrow 6$

$x = 0$ $y = 0$

$\Rightarrow \Leftarrow$ (9)

(B) $\delta_1 = 0, \gamma_2 = 0$

$x > 0, y > 0$

(1) $a = \lambda p_x$

(2) $b = \lambda p_y$

(9) $I = p_x x + p_y y$

$\frac{a}{b} = \frac{p_x}{p_y}$

(1) $a = \lambda p_x - \gamma_1$

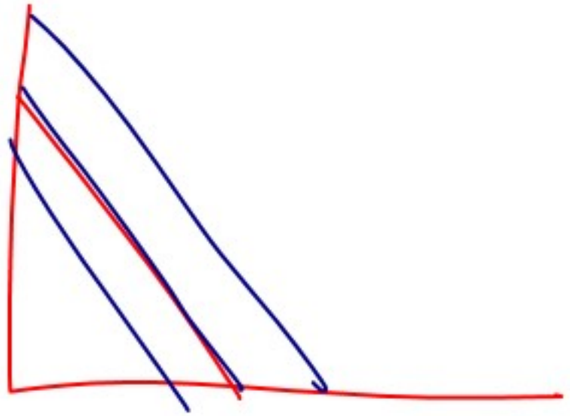
(2) $b = \lambda p_y - \gamma_2$

(3) $\gamma_1 \geq 0$, $\gamma_2 \geq 0$ (4)

(5) $\gamma_1 x = 0$ (6) $\gamma_2 y = 0$

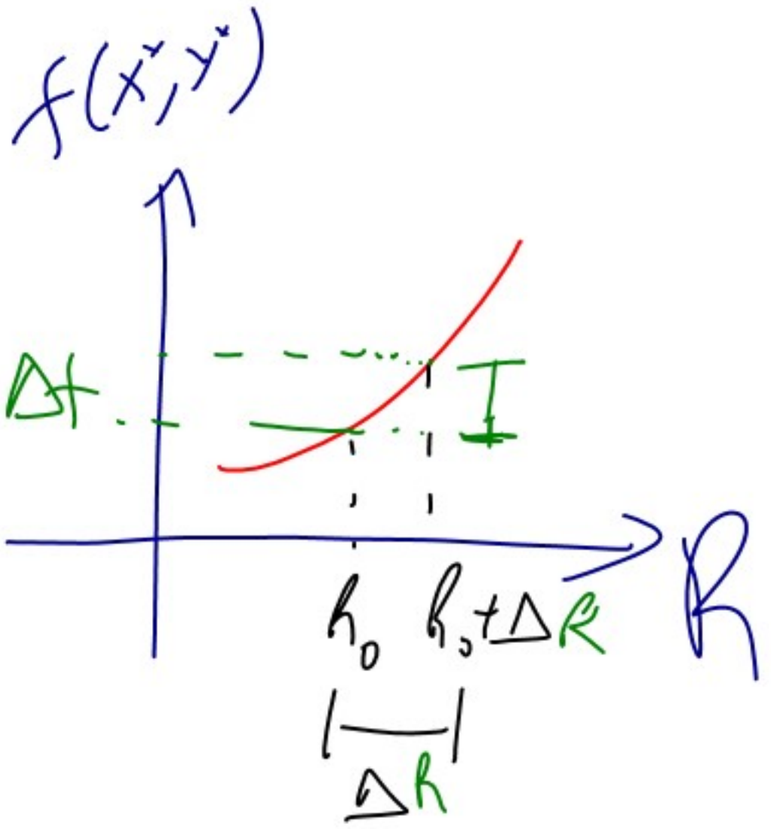
(7) $x \geq 0$ (8) $y \geq 0$

(9) $I = p_x x + p_y y$



$\frac{1}{p_x} \frac{a}{} = \frac{b}{} \frac{1}{p_y}$

$$\frac{\partial f(x^*, y^*)}{\partial R} = \gamma$$



$$\Delta f \simeq \Delta R \cdot \frac{\partial f}{\partial R}$$

$$\simeq \Delta R \cdot \gamma$$