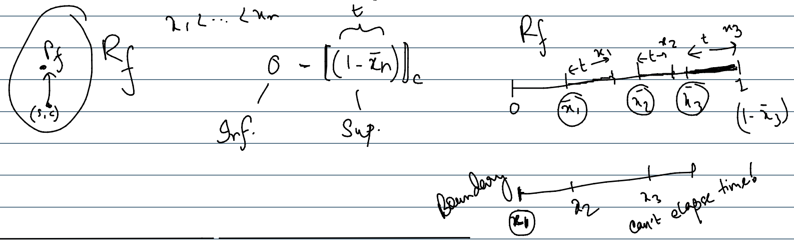
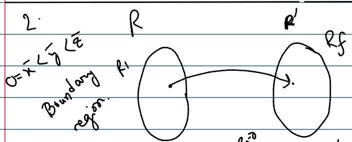
Bounded Labelled Graph

→ We are now concerned about getting the Lower and Upper Bound of the integral $\int p$.

1. $(s,c) \in R_f$ reaches the final region R_f.



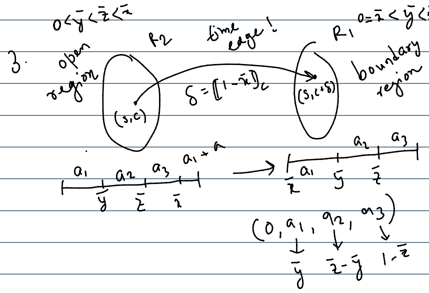
2. $0=\bar{x}<\bar{y}<\bar{z}$ Boundary region R_1



(R, L, l, U, u) $\quad e_0$, $e_1 = \bar{y}$, e_2 $\quad (R', L', l', U', u')$

$a_0 = 0$

$$L = [\![a_0 \cdot \underbrace{0}_{e_0} + a_1 \cdot \underbrace{(\bar{y}-0)}_{e_1} + a_2\underbrace{(\bar{z}-\bar{y})}_{e_2} + a_3 \cdot \underbrace{(1-\bar{z})}_{e_3}]\!]_c$$

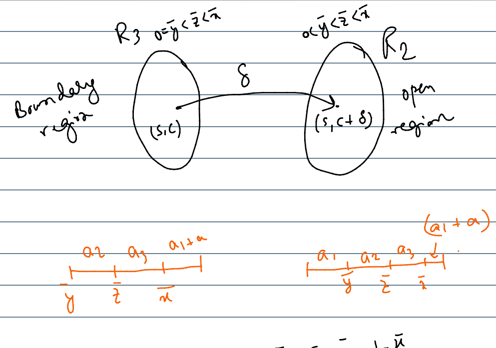
3. 

L for R_2:

$$[\![a_1 \cdot (\bar{y} + (1-\bar{x})) + a_2 \cdot (\bar{z}-\bar{y}) + a_3 \cdot (\bar{x}-\bar{z}) + a \cdot (1-\bar{x})]\!]_c$$

$$\boxed{= [\![a_1 \cdot \bar{y} + a_2 \cdot (\bar{z}-\bar{y}) + a_3 \cdot (\bar{x}-\bar{z}) + (a_1+a) \cdot (1-\bar{x})]\!]_c}$$

(a_1+a); a_1 a_2 a_3; $\bar{y}$ $\bar{z}$ $\bar{x}$

4. 

$$\delta = [\![1-\bar{x}]\!]_c$$

$$[\![\bar{y}]\!]_{c+\delta} = [\![\bar{y} + (1-\bar{x})]\!]_c$$

$$[\![\bar{z}-\bar{y}]\!]_{c+\delta} = [\![\bar{z}-\bar{y}]\!]_c$$

$$[\![\bar{x}-\bar{z}]\!]_{c+\delta} = [\![\bar{x}-\bar{z}]\!]_c$$

$$[\![1-\bar{x}]\!]_{c+\delta} = 0.$$

L for R_3:

$$[\![a_1 \cdot (\bar{y} + (1-\bar{x})) + a_2(\bar{z}-\bar{y}) + a_3 \cdot (\bar{x}-\bar{z}) + a \cdot (1-\bar{x})]\!]_c$$

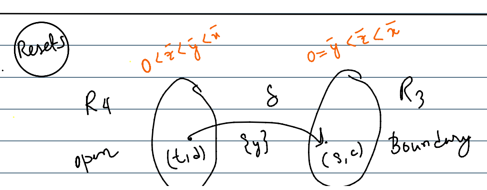
Since $\bar{y} = 0$.

$$= [\![a_1 \cdot (1-\bar{x}) + a_2 \cdot (\bar{z}) + a_3 \cdot (\bar{x}-\bar{z}) + a(1-\bar{x})]\!]_c$$

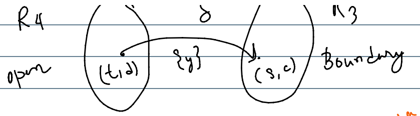
$$\boxed{= [\![a_2 \cdot (\bar{z}) + a_3 \cdot (\bar{x}-\bar{z}) + (a_1+a) \cdot (1-\bar{x})]\!]_c}$$

a_2 a_3 a_1+a; $\bar{y}$ $\bar{z}$ $\bar{x}$

5. Resets



$p(t) = b$



when $\delta = 0$,

a_2 a_3 a_3 $a_1 + a$

$\bar{z}$ $\bar{y}$ $\bar{x}$

a_2 a_3 $a_1 + a$

$\bar{y}$ $\bar{z}$ $\bar{x}$

when $\delta \to (1 - \bar{x})$,

a_2 a_3 a_3 $a_1 + b$

$\bar{z}$ $\bar{y}$ $\bar{x}$