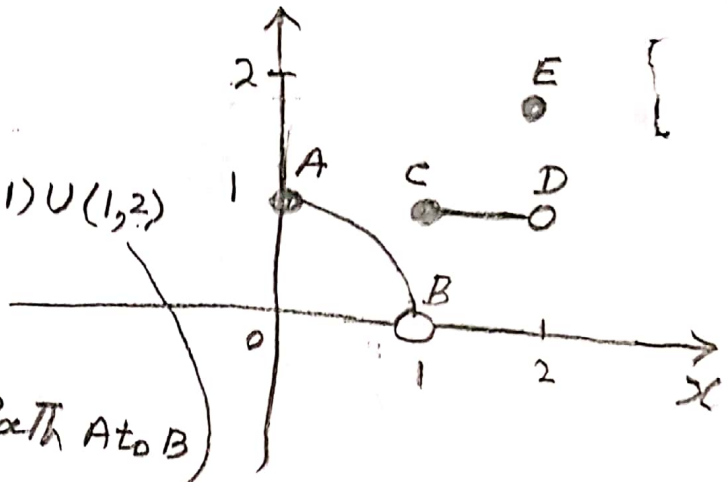
Exercise 2.4

Q9 (b) $\lim_{x \to c}$ exists $\forall\, c \in (0,1) \cup (1,2)$



See the Path A to B

See the path C to D

For (c) $x = 2$, at pt. D there is a path C to D on L.H.S. but no path on the right hand side of D

$\therefore$ L.H. $\lim_{x \to 2} f(x)$ exists but R.H. $\lim_{x \to 2}$ does not exist.

(d) The pt. corresponding to $x = 0$ is A (See fig)

No path on L.H.S. to reach A

$\therefore$ no L.H.S exists at $x = 0$

but on the R.H.S. $\exists$ a path $\overset{\frown}{BA}$

to reach at pt A i.e. $x = 0$

$\therefore$ R.H.S. $\lim_{x \to 0}$ exists $(= 1)$