N.B. $Cl(A_i) = A$ $i = 1, 2, \ldots$

(7)

Alternatively $Cl(H)$ = the smallest closed set containing H. $H \subset Cl(A_1) = (0, \frac{1}{1+1}] \cup [1, \infty) = (0, \frac{1}{2}] \cup [1, \infty)$ but $\frac{1}{2} \in H$ and $\frac{1}{2} \notin Cl(A_k)$ for any

$1\frac{1}{2}$ ✓ $k > 1$ $\therefore Cl(H) = \cancel{Cl(A_1)} = (1, \frac{1}{2}] \cup [1, \infty)$

iii) $Cl(K)$ = the smallest closed set containing K.

Closed sets of A are of the form $(0, \frac{1}{n+1}] \cup [n, \infty)$

× $Cl(A_1) = (0, \frac{1}{2}] \cup [1, \infty)$

× $Cl(A_2) = (0, \frac{1}{3}] \cup [2, \infty)$

× $Cl(A_k) = (0, \frac{1}{k+1}] \cup [k, \infty)$

these are complements of A_i i.e. $A - A_i$

$K \subset Cl(A_1)$, but $3/2 \in K$ and $3/2 \notin A_k$, $k \geqslant 2$ $\therefore Cl(K) = \cancel{Cl(A_1)} = (0, \frac{1}{2}] \cup [1, \infty)$

$3/2$ not a limit point of K since $3/2 \in A_2$ but

$1/4 \notin A_2 - K = (\frac{1}{1+2}, 2) - \{1/4, 3/2\} = (\frac{1}{3}, \frac{3}{2}) \cup (\frac{3}{2}, 2)$

but $1/4$ is a limit point of K since $1/4 \notin A_1, A_2, A_3$ and $1/4, 3/2 \in A_k$, $k \geqslant 4$

✓ $\therefore$ every open set which contains $1/4$ also contains $3/2 \in K$

$A_1 = (\frac{1}{2}, 1)$. No point in A_1 is a limit point of K since $A_1 \cap K - \{x\} = \phi$ where $x \in (\frac{1}{2}, 1)$.

If $x \geqslant 1$, $x \neq \frac{3}{2}$ then $x \in A_k$, $k > x$, and $3/2 \in A_k$ $\therefore$ x is a limit point of K

If $x < \frac{1}{2}$ then $x \in A_k$, $k > \frac{1}{x} + 1 > 1$ then $3/2 \in A_k$ there is a limit point of K.

$\frac{3}{4}$ $\therefore$ The set of limit points of K is $Cl(A_1) - \{3/2\} = (0, \frac{1}{2}] \cup [1, 3/2) \cup (3/2, \infty)$ ✓