(8)

Since $A_n \subset A_m$ for $n > m$

$\therefore (x_1, x_2) \notin C = \bigcap_{n=1}^{\infty} [-1/n, 1/n] \times [-n, n]$ for $|x_1| > 0$ ie $x_1 \neq 0$

$(0, x_2) \in D$ if $-1 \leq x_2 \leq 1$

If $-1 \leq x_2 \leq 1$ then $x_2 \in B_1$

Since $B_1 \subset B_n$ for $n \geq 1$

$(0, x_2) \in \bigcap_{n=1}^{\infty} [-1/n, 1/n] \times [-n, n] = C$ for $-1 \leq x_2 \leq 1$

Suppose $|x_2| > 1$, then either $x_2 < -1$ or $x_2 > 1$

so $x_2 \notin [-1, 1]$ so $(0, x_2) \notin D$ and

$(0, x_2) \notin \bigcap_{n=1}^{\infty} [-1/n, 1/n] \times [-n, n] = C$ since $B_1 \subset B_n$, $n \geq 1$.

We have shown $(x_1, x_2) \notin C$ then $(x_1, x_2) \notin D$, and if $(x_1, x_2) \in C$ then $(x_1, x_2) \in D$, hence $C = D$

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It would be better to set this out:

If $x \notin D$ then either $x_1 \neq 0$ and so ——— $x \notin C$

or $|x_2| > 1$ ———

If $x \in D$ then – – – – — $x \in C$