Case $\boxed{2}$: $\forall x \in \mathbb{Z}$, $(x \in B_n) \Rightarrow (x \in A_n)$, let n be an arbitrary integer ≥ 3,

$\therefore$ Assume that the hypothesis is correct such that $n = \frac{b+1}{k}$ for some integer k and sub b in for a in $\boxed{B}$

$$\boxed{B} \quad an + 1 \in \mathbb{Z}$$
$$\Rightarrow bn + 1 \in \mathbb{Z}$$
$$\Rightarrow b\frac{b+1}{k} + 1 \in \mathbb{Z}$$
$$\Rightarrow b(b/k + 1/k) + 1 \in \mathbb{Z}$$
$$\Rightarrow b^2/k + b/k + 1 \in \mathbb{Z}$$

contradiction

- b and $(b+1)$ are coprime so if a k exsists such that $(b+1)$ can be divided into an integer n, the same k can not divide b into an integer, so theres a contradiction.

$\therefore$ Since Case $\boxed{1}$ and Case $\boxed{2}$ is false, A_n is not a proper subset of B_n and B_n is not a proper subset of A_n so A_n and B_n must be disjoint