

Ques! let $X = \{x : x = n^2 + 2n + 1, n \in \mathbb{N}\}$ and
 $Y = \{x : x = 3n^2 + 7, n \in \mathbb{N}\}$ then

- (a) $X \cap Y$ is subset of $\{x : x = 3n + 5, n \in \mathbb{N}\}$
- (b) $X \cap Y \subseteq \{x : x = n^2 + n + 1, n \in \mathbb{N}\}$
- (c) $34 \in X \cap Y$
- (d) none of these.

Solution! -

Ans (c).

$$\text{if } n^2 + 2n + 1 = 3n^2 + 7$$

$$n^3 - 3n^2 + 2n - 6 = 0$$

$$(n-3)(n^2+2) = 0$$

$$n = 3 \text{ as } n \in \mathbb{N}$$

$$\text{so } x = 3 \times 3^2 + 7 = 34 \in X \cap Y$$

in (a) and (b) $x \neq 34$, for any $n \in \mathbb{N}$.

