4. If $a \in R$ and the equation $-3(x-[x])^2 + 2(x-[x]) + a^2 = 0$ (where $[x]$ deontes the greatest integer $\leq x$) has no integral solution, then all possible values of a lie in the interval :

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(1) $(-1, 0) \cup (0, 1)$
(2) $(1, 2)$
(3) $(-2, -1)$
(4) $(-\infty, -2) \cup (2, \infty)$

Soln.->

4. Given equation is

$-3(x-[x])^2 + 2(x-[x]) + a^2 = 0$

$\Rightarrow a^2 = 3.\ \{x\}^2 - 2\{x\}$

$= 3.\left(\{x\} - \frac{1}{3}\right)^2 - \frac{1}{3}\ (\because \{x\} \neq 0 \Rightarrow a^2 \neq 0)$

$\Rightarrow a^2 \in (0, 1)$

$\Rightarrow a \in (-1, 0) \cup (0, 1).$