永中全重完桐

DATE 2024.8.21,29 NO. 三校数31 三校数作21

ex.8 等差 $\langle a_n \rangle$, $a_8 = 35$, $S_{20} = S_{30}$，求：

1) a_1 2) d

$$\begin{cases} a_1 + 7d = 35 \\ a_{21} + a_{22} + \dots + a_{30} = 0 \end{cases}$$

$$\Rightarrow \begin{cases} a_1 + 7d = 35 \\ 10a_1 + 245d = 0 \end{cases} \Rightarrow \begin{cases} a_1 = 49\ \# \\ d = -2\ \# \end{cases}$$

3) S_n 在第 n 项出现 max，求 x

$S_1 = a_1 = 49$

$S_2 = a_1 + a_2 = 49 + 47$

$S_3 = a_1 + a_2 + a_3 = 49 + 47 + 45$

$51 - 2n \geq 0 \Rightarrow n \leq 25.5$

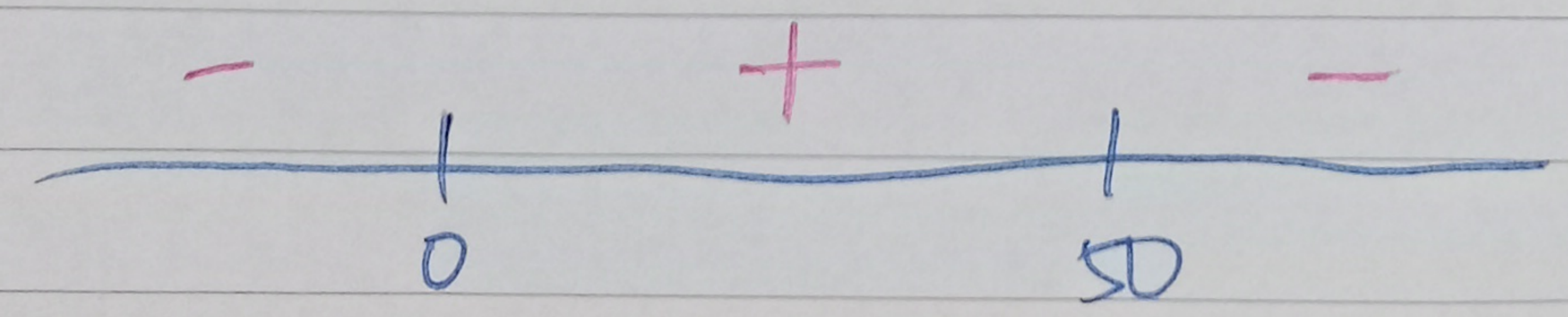
$S_{25} = 49 + 47 + \dots + 1$

$S_{26} = 49 + 47 + \dots + 1 + (-1)$ $\Rightarrow x = 25\ \#$

4) $\min\{n \in N \mid S_n < 0\} = 51\ \#$

$$S_n = \frac{n[2a_1 + d(n-1)]}{2} < 0$$

$$\Rightarrow \frac{n(98 - 2n + 2)}{2} < 0 \Rightarrow n(50 - n) < 0$$



$\Rightarrow n > 50$