

SUBJECT: _____

DATA: _____

NUMBER: _____

14, 25

برای سری هم رفت B بنام خودت بنویس

الف) $t_n = 3n^2 - 1$ اول $t_1 = 3(1)^2 - 1 = 2$ (1)
 $t_2 = 3(2)^2 - 1 = 11$ / $t_3 = 3(3)^2 - 1 = 26$ / $t_4 = 3(4)^2 - 1 = 47$ ✓ (2)
 $t_5 = 3(5)^2 - 1 = 74$ ✓

ب) $t_n = \frac{2n+1}{n+2}$ $t_1 = \frac{2(1)+1}{1+2} = \frac{3}{3} = 1$ / $t_2 = \frac{2(2)+1}{2+2} = \frac{5}{4}$ (3)
 $t_3 = \frac{2(3)+1}{3+2} = \frac{7}{5}$ / $t_4 = \frac{2(4)+1}{4+2} = \frac{9}{6} = \frac{3}{2}$ / $t_5 = \frac{2(5)+1}{5+2} = \frac{11}{7}$ (4)

الف) $t_n = \frac{(-1)^n}{\sqrt{n+2}}$ $t_1 = \frac{(-1)^1}{\sqrt{1+2}} = \frac{-1}{\sqrt{3}}$ (2)
 $t_2 = \frac{(-1)^2}{\sqrt{2+2}} = \frac{1}{2}$ (3)

ب) $t_n = 2n - \left\lfloor \frac{n}{2} \right\rfloor$ $t_1 = 2(1) - \left\lfloor \frac{1}{2} \right\rfloor = 2 - 0 = 2$ (4)
 $t_2 = 2(2) - \left\lfloor \frac{2}{2} \right\rfloor = 4 - 1 = 3$ (5)

الف) $t_n = 2n - 10 \Rightarrow 2n - 10 < 0 \Rightarrow 2n < 10 \Rightarrow n < 5$ (2)

ب) $n^2 - 12n + 27 < 0 \Rightarrow (n-3)(n-9) < 0$ (3)
 $3 < n < 9 \Rightarrow n \in (3, 9)$ (4)

15) $t_n = 2n - 14 \Rightarrow 2n - 14 < 0 \Rightarrow 2n < 14 \Rightarrow n < 7$ (5)
 $n \in (3, 7)$ (6)

ب) $t_n = n^2 - 12n + 27 \Rightarrow (n-3)(n-9) < 0$ (7)
 $3 < n < 9$ (8)

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$t_8 = 7$ $t_9 - t_8 = d \Rightarrow \frac{2(9) - 7}{9 - 8} = \frac{11}{1} = 11$ (9)
 $t_9 = 22$

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$t_8 = t_1 + 7d \Rightarrow 7 = t_1 + 7(11) \Rightarrow t_1 = -74$ (10)
 $t_n = -74 + 11(n-1) \Rightarrow t_2 = -74 + 11(1) = -63$ (11)

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الف) $t_n = n^2 - 4n + 2 \Rightarrow$ $n_{min} = \frac{-b}{2a} = \frac{4}{2} = 2$ (4)

Simple $\Rightarrow 2^2 - 4(2) + 2 = -2$ (1, 2, 5)

ب) $t_n = n^2 + 4n + 1 \Rightarrow n_{min} = \frac{-b}{2a} = \frac{-4}{2} = -2$

ن. ض. اعداد طبیعی است. نمی تواند منفی باشد.

Simple $\Rightarrow (-2)^2 + 4(-2) + 1 = -3$

$t_1 = 4, t_2 = 15, t_3 = 22$

$t_{min} = t_1 = 4$

$t_n = -\frac{1}{2}n^2 + \frac{1}{2}n - \frac{1}{2} \Rightarrow$ $2a = 1 \Rightarrow a = \frac{1}{2}$ (10)

$\begin{matrix} -\frac{1}{2} & \frac{1}{2} & -\frac{1}{2} \\ \rightarrow & \rightarrow & \rightarrow \\ +\frac{1}{2} & +\frac{1}{2} & +\frac{1}{2} \end{matrix}$

$2a + b = -\frac{1}{2} \Rightarrow 2(\frac{1}{2}) + b = -\frac{1}{2} \Rightarrow b = -1$

$a + b + c = -\frac{1}{2} \Rightarrow \frac{1}{2} - 1 + c = -\frac{1}{2} \Rightarrow c = 1$

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$t_n = an^2 + bn + c \Rightarrow n^2 - 4n + 1$

$\Rightarrow t_1 = 1 - 4(1) + 1 = -2$

$t_n = -\frac{1}{2}n^2 + \frac{1}{2}n - \frac{1}{2} \Rightarrow$ $2a = 1 \Rightarrow a = \frac{1}{2}$ (15)

$\begin{matrix} -\frac{1}{2} & \frac{1}{2} & -\frac{1}{2} \\ \rightarrow & \rightarrow & \rightarrow \\ +\frac{1}{2} & +\frac{1}{2} & +\frac{1}{2} \end{matrix}$

$2a + b = 0 \Rightarrow 2(\frac{1}{2}) + b = 0 \Rightarrow b = -1$

$a + b + c = -\frac{1}{2} \Rightarrow \frac{1}{2} - 1 + c = -\frac{1}{2} \Rightarrow c = 1$

$t_n = an^2 + bn + c \Rightarrow n^2 - 4n - 1$

20 $[-\infty, a + \varepsilon], [2a + 1, +\infty)$ اشتراک منتهی (9)

$\Rightarrow a + \varepsilon \leq 2a + 1 \Rightarrow \boxed{2 < a}$

۱) دارای منتهی
۲) اشتراک منتهی نیست

الف) $1, 4, 9, 16, \dots \Rightarrow \frac{9n^2}{4} + 1 = 25$ (10)

ب) $1, 4, 9, 16, \dots \Rightarrow \frac{9n^2}{4} + 1 = 19$ (15)

ج) $1, 4, 9, 16, \dots \Rightarrow \frac{9n^2}{4} + 1 = 49$ (20)

د) اصل سوال $\Rightarrow n(A \cup B) = n(A) + n(B) - n(A \cap B) = 22 + 19 - 9 = 32$

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