

الف) $t_n = Cn^2 - 1 \Rightarrow 29, 11, 25, 49, 81, 121$

مجموعه اعداد مربع کامل

ب) $t_n = \frac{n+1}{n+2} \Rightarrow \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}, \frac{6}{7}, \frac{7}{8}, \frac{8}{9}$

ج) $t_n = \frac{(-1)^n}{\sqrt{n+2}} \Rightarrow t_{10} = \frac{(-1)^{10}}{\sqrt{10+2}} = \frac{1}{\sqrt{12}}$

د) $t_n = 2n - 1 \Rightarrow 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99$

ه) $t_n = 2n - 10 \Rightarrow 2n - 10 = 0 \Rightarrow 2n = 10 \Rightarrow n = 5 \rightarrow$ جواب است $5 - 1 = 4 \rightarrow$ منفی

و) $t_n = 1 \Rightarrow (n-4)(n-10) \Rightarrow \left. \begin{array}{l} n-4=0 \Rightarrow n=4 \\ n-10=0 \Rightarrow n=10 \end{array} \right\} \begin{array}{c} 4 \quad \dots \quad 10 \\ + \quad - \quad + \end{array}$

$4 < n < 10 \Rightarrow (10-4)-1 = 5 \rightarrow$ منفی

ز) $t_n = 2n - 1 \Rightarrow 2n = 1 \Rightarrow n = 1 \rightarrow$ جواب است

ح) $t_n = n^2 - 1 \Rightarrow (n-1)(n+1) \Rightarrow \left. \begin{array}{l} n=1 \\ n=9 \end{array} \right\} \begin{array}{c} 1 \quad \dots \quad 9 \\ + \quad - \quad + \end{array}$

$1 < n < 9 \Rightarrow (9-1)+1 = 8 \rightarrow$ جواب است

ط) $t_n = \frac{n^2 - 1}{n^2 - 2n + 1} \Rightarrow \frac{n^2 - 1}{(n-1)^2} \Rightarrow \frac{(n-1)(n+1)}{(n-1)^2} \Rightarrow \frac{n+1}{n-1} \Rightarrow \frac{10+1}{10-1} = \frac{11}{9}$

$$1) t_n = n^2 - 9n + 2 \quad \min = \frac{-b}{2a} \Rightarrow \frac{9}{2} = 4.5$$

$$t_c = 9 - 1n + 2 = -7$$

$$2) t_n = n^2 + 9n + 1 \quad \min = \frac{-b}{2a} \Rightarrow \frac{-9}{2} = -4.5$$

$$t_r = 9 + 1n + 1 = 10$$

$$t_n = -9, -19, -29, -39, -49, \dots$$

$$t_n = an^2 + bn + c \quad \begin{cases} t_1 = -9 \\ t_r = -19 \\ t_c = -9 \end{cases} \Rightarrow \begin{cases} a(1)^2 + b(1) + c = -9 \\ a(r)^2 + b(r) + c = -19 \\ a(c)^2 + b(c) + c = -9 \end{cases} \Rightarrow \begin{cases} a + b + c = -9 \\ 9a + rb + c = -19 \\ 9a + cb + c = -9 \end{cases} \Rightarrow \begin{cases} c + b = -9 \\ 8a + rb + c = -10 \\ 8a + cb + c = 0 \end{cases}$$

$$\begin{cases} ca + b = -9 \\ 8a + rb = -10 \\ 8a + cb = 0 \end{cases} \Rightarrow \begin{cases} ca + b = -9 \\ 8a + rb = -10 \\ 8a + cb = 0 \end{cases} \Rightarrow \begin{cases} ca + b = -9 \\ 8a + rb = -10 \\ 8a + cb = 0 \end{cases}$$

$$ca + b = -9 \Rightarrow 8a = -9 - b \Rightarrow a = \frac{-9 - b}{8}$$

$$8a + rb = -10 \Rightarrow 8 \left(\frac{-9 - b}{8} \right) + rb = -10 \Rightarrow -9 - b + rb = -10 \Rightarrow rb - b = -1 \Rightarrow b(r - 1) = -1 \Rightarrow b = \frac{-1}{r - 1}$$

$$8a + cb = 0 \Rightarrow 8 \left(\frac{-9 - b}{8} \right) + cb = 0 \Rightarrow -9 - b + cb = 0 \Rightarrow cb - b = 9 \Rightarrow b(c - 1) = 9 \Rightarrow \frac{-1}{r - 1} (c - 1) = 9 \Rightarrow c - 1 = -9(r - 1) \Rightarrow c = -9r + 8$$

$$t_n = -9, -19, -29, -39, -49, \dots \quad t_n = an^2 + bn + c \Rightarrow t_n = 2n^2 - 9n - 7$$

$$\begin{cases} t_1 = -9 \\ t_r = -1 \\ t_c = 9 \end{cases} \Rightarrow \begin{cases} a(1)^2 + b(1) + c = -9 \\ a(r)^2 + b(r) + c = -1 \\ a(c)^2 + b(c) + c = 9 \end{cases} \Rightarrow \begin{cases} a + b + c = -9 \\ 9a + rb + c = -1 \\ 9a + cb + c = 9 \end{cases} \Rightarrow \begin{cases} ca + b = 9 \\ 8a + rb + c = 10 \\ 8a + cb + c = 18 \end{cases}$$

$$ca + b = 9 \Rightarrow 8a = 9 - b \Rightarrow a = \frac{9 - b}{8}$$

$$8a + rb + c = 10 \Rightarrow 8 \left(\frac{9 - b}{8} \right) + rb + c = 10 \Rightarrow 9 - b + rb + c = 10 \Rightarrow rb + c = 1 \Rightarrow c = \frac{1 - rb}{r}$$

$$8a + cb + c = 18 \Rightarrow 8 \left(\frac{9 - b}{8} \right) + cb + c = 18 \Rightarrow 9 - b + cb + c = 18 \Rightarrow cb + c = 9 \Rightarrow c(b + 1) = 9 \Rightarrow \frac{1 - rb}{r} (b + 1) = 9 \Rightarrow (1 - rb)(b + 1) = 9r$$

$$b + 1 - rb^2 - rb = 9r \Rightarrow -rb^2 - (r - 1)b + (1 - 9r) = 0 \Rightarrow rb^2 + (r - 1)b + (9r - 1) = 0$$

$$ra = 9 \Rightarrow a = 2 \quad ca + b = 9 \Rightarrow b = -1$$

$$r + (-1) + c = -9 \Rightarrow c = -9$$

$$(-\infty, a + \varepsilon] \cup [ra + 1, +\infty) \Rightarrow a + \varepsilon \geq ra + 1 \Rightarrow \varepsilon \geq a - 1$$

$$\boxed{\begin{aligned} a = c &\rightarrow \text{مساوی} \\ a < c &\rightarrow \text{کمتر} \\ a > c &\rightarrow \text{بیشتر} \end{aligned}}$$

$$\hookrightarrow [a + \varepsilon, ra + 1] \rightarrow \text{میان}$$

$$1) a, b, c, \dots, 99 \Rightarrow a_n = 99 \quad d = c, a, b, c, \dots$$

$$a_n = c + (n - 1)c = 99 \Rightarrow c + (n - 1)c = 99 \Rightarrow n - 1 = 9 \Rightarrow n = 10$$

$$\Rightarrow n - 1 = 9 \Rightarrow n = 10$$

$$2) a, b, c, \dots, 100 \Rightarrow a_n = 100 \quad d = a, b, c, \dots$$

$$a_n = a + (n - 1)a = 100 \Rightarrow a + (n - 1)a = 100 \Rightarrow n - 1 = 9 \Rightarrow n = 10$$

$$n = 10$$

$$n(c, a) = n(c, b) + n(b, a) - n(c, b)$$

$$\Rightarrow n(c, a) + n(b, c) - n(b, a) = n(c, a)$$