

$$t_n = 5, 9, 13, 17, \dots \quad a_n = 5 + (n-1)4 \rightarrow 5 + 4n - 4 \rightarrow t_n = 4n + 1$$

الف) $t_n = 4n + 1$

ب) $t_1 = 4 \times 1 + 1 = 5$

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$$t_n = 4, 10, 16, 22, \dots \quad a_n = 4 + (n-1)6 \rightarrow a_n = 4 + 6n - 6 \rightarrow t_n = 6n - 2$$

الف) $S_{10} = 5(a_1 + a_{10}) = 5 \times 48 = 240$

$a_{10} = 42$

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ب) $4 \times 8 = 32 \rightarrow a_9 + a_8 + a_7 + a_6 = 32$

$a_9 = 118$

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 $a_9 + a_9 + d + a_9 + 2d + a_9 + 3d = 4a_9 + 6d = 4a_9 + 24 = 32$

$$1 + \sqrt{3}, 2, 3 - \sqrt{3}, \dots$$

$d = 2 - 1 - \sqrt{3}$

$d = 1 - \sqrt{3}$

$a_n = a_1 + (n-1)d$

$a_n = 1 + \sqrt{3} + (n-1)(1 - \sqrt{3}) \rightarrow 1 + \sqrt{3} + n - 1 - n\sqrt{3} + \sqrt{3} = 2\sqrt{3} - n\sqrt{3} = \sqrt{3}(2 - n)$

$a_{25} = \sqrt{3}(-23) = -23\sqrt{3}$
 $a_{23} = \sqrt{3}(-1) = -\sqrt{3}$

$-23\sqrt{3} - (-\sqrt{3}) = -22\sqrt{3}$

$-\sqrt{3} - (-23\sqrt{3}) = 22\sqrt{3}$

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$a_n = \Delta^{2n}, 3 \times \Delta^{2n}, \Delta^y \rightarrow 4 \times \Delta^{2n} = \Delta^{2n} + \Delta^y \rightarrow 4 = 1 + \Delta^{y-2n} \rightarrow \Delta = \Delta^{y-2n}$

$\begin{cases} y - 2n = 1 \\ n + y = 4 \end{cases} \Rightarrow +3n = 3$

$n = 1 \quad y = 3$

$b_n = n, 2, y \rightarrow 4 = n + y$

$r(r) = n + y$

$\Rightarrow ny = 3 \times 1 = 3$

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$2n - 1, 2n - 1, 4n, \dots \rightarrow -3, 0, 3, \dots \quad a_n = -3 + (n-1)3$

$a_4 = -3 + (3)3$

$a_4 = 6$

$2b = a + c$

$4n - 1 = 2n - 1$

$2 = 4n \rightarrow n = \frac{1}{2}$

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$$a_n = 3, 5, 7, \dots \quad a_n = 2n + 1 \rightarrow 3, 5, 7, \dots, a_r = 41$$

$$b_n = 2, 5, 8, \dots \quad a_n = 3n - 1 \rightarrow 2, 5, 8, \dots, a_r = 49$$

$$\text{مشترک} = 5, 11, 17, \dots \quad a_n = 4n - 1$$

$$\begin{aligned} 5 &\leq 4n - 1 \leq 41 \\ 4 &\leq 4n & 4n &\leq 42 \\ n &\geq 1 & n &\leq 10.5 \end{aligned} \Rightarrow 1 \leq n \leq 10 \rightarrow \text{جمله مشترک اول و دوم}$$

$$\begin{aligned} a_1 + a_r + a_p &= 21 \\ a_1 + a_r + a_b &= 105 \\ \left. \begin{aligned} 3a_1 + 3d &= 21 \\ 3a_1 + 9d &= 105 \end{aligned} \right\} \begin{aligned} 3d &= 18 \\ d &= 6 \\ a_1 &= -1 \end{aligned} \end{aligned}$$

$$a_r - a_r + a_1 = 3a_1 \rightarrow -21 \rightarrow 3 = n \times -21 \rightarrow n = \frac{-1}{3} \text{ برابر}$$

$$a_1 + 3d - a_1 - d + a_1 = a_1 + d = -21 + 18 = -3$$

$$S_p = 15$$

$$S_p = \frac{p}{2}(a_1 + a_r) = 15 \times 2 \rightarrow a_1 + a_r = 10 \rightarrow 2a_1 + 2d = 10$$

$$a_f + a_b = 25$$

$$\boxed{a_1 + d = 5} \rightarrow a_r = 5$$

$$a_1 + 3d + a_1 + 4d = 25$$

$$2a_1 + 7d = 25$$

$$a_1 + d = 5$$

$$\left. \begin{aligned} a_1 + 4d &= 25 \\ a_1 + d &= 5 \end{aligned} \right\} \rightarrow 3d = 20 \rightarrow d = \frac{20}{3}$$

$$a_{10} = (4 \times 10) - 3 = 37$$

$$a_1 = 1$$

$$a_f + a_b = a_r + 2d + a_r + 3d = 25$$

$$10 + 5d = 25$$

$$d = 3$$

$$a_{10} = a_r + 10d = 5 + 30 = 35$$

$$a_n = 1 + (n-1) \times 3 \rightarrow a_n = 3n - 2$$

$$a_1 \neq 0 \quad S_9 = 9 S_p \rightarrow \frac{9}{2}(2a_1 + 18d) = 9 \times \frac{p}{2}(2a_1 + 2d) = 9(a_1 + d) = 9(a_1 + 3d)$$

$$\frac{a_r}{a_v} = \frac{a_1 + 19d}{a_1 + 9d} = \frac{a_1 + 18a_1}{a_1 + 18a_1} = \frac{19a_1}{19a_1} = 1$$

$$a_1 + 3d = 3(a_1 + d)$$

$$\begin{aligned} 3d &= 2a_1 + 3d \\ d &= 2a_1 \end{aligned}$$

$$a_f = 14 + 3 = 17$$

$$a_1 = 11 \quad a_v = 35 \rightarrow a_1 + 4d = 35 \rightarrow 4d = 24 \rightarrow d = 6 \rightarrow a_n = 6n + 5$$

$$b_1 = 31 \quad b_f = 17 \rightarrow b_f = 31 + 3d = 17 \rightarrow 3d = -14 \rightarrow d_b = -\frac{14}{3}$$

$$b_n = -\frac{14}{3}n + 31$$

$$d = \frac{b - a}{k + 1} \rightarrow \frac{17 - 31}{k + 1} = \frac{-14}{k + 1} = -\frac{14}{k + 1}$$

$$+ \Delta k + \Delta = +25 \rightarrow \Delta k = 20 \rightarrow k = 4$$