

$$t_n = 5, 9, 13, 17, \dots$$

+5 +5 +5

$$a_n = 4n + 1$$

$$a_{10} = 4 \times 10 + 1 = 41$$

(ب) جواب صحیح

$$t_n = 4, 10, 16, 22, \dots$$

+6 +6 +6

$$a_n = 6n + 4 \rightarrow a_{10} = 64$$

$$\sum_{i=1}^n \frac{10}{i} (4 + 6i) \rightarrow$$

$$6 \times 10 = 60$$

$$t_n = 4, 10, 16, 22, 28, 34, 40, \dots$$

$$6 \times 10 = 60 \rightarrow a_{10} = 60 \rightarrow a_{11} = 66$$

$$t_n = 4, 10, 16, 22, 28, 34, 40, \dots, 110, 122, 134, 146 \Rightarrow \boxed{146}$$

+12 +12 +12

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

$$a_n = 1 + \sqrt{3} + (n-1)(1 - \sqrt{3}) \rightarrow a_{10} = 1 + \sqrt{3} + 9(1 - \sqrt{3}) \rightarrow$$

$$1 + \sqrt{3} + 9 - 9\sqrt{3} = 10 - 8\sqrt{3}$$

$$a_{10} = 1 + \sqrt{3} + 9(1 - \sqrt{3}) = 1 + \sqrt{3} + 9 - 9\sqrt{3} = 10 - 8\sqrt{3}$$

$$a_{10} - a_{9} = 10 - 8\sqrt{3} - (10 - 11\sqrt{3}) = 3 - 3\sqrt{3}$$

$$a_n = d^m, 3 \times 2d^m, d^y$$

$$3 \times 2d^m - d^m = d \rightarrow 6d^m - d^m = d \rightarrow 5d^m = d \rightarrow d^m \times 5 = d$$

$$d^m(5-1) = d \rightarrow d^m \times 4 = d$$

$$3 \times 2d^m + d = d^y \rightarrow 6d^m + d^m \times 4 = d^y \rightarrow d^m(6+4) = d^y \rightarrow d^{10} \times d = d^y \rightarrow$$

$$h_n = x, y, y$$

$$\frac{n+y}{2} = 2 \rightarrow n+y = 4 \rightarrow y = 4-n$$

$$d^{m+1} = d^y$$

$$m+1 = y$$

$$m+1 = 4-n$$

$$m=3 \rightarrow \boxed{m=1}$$

$$\boxed{y=3}$$

$$a_1, 2a_1 - 2, 2a_1 - 1, 4a_1, \dots$$

$$2a_1 - 1 + 3 = 4a_1$$

$$2a_1 + 2 = 4a_1 \rightarrow 2a_1 = 2 \rightarrow a_1 = 1$$

$$a_n = -3, 0, 3, 6, \dots$$

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

$$b_n = 2, 5, 8, \dots \rightarrow b_n = 3n - 1 \rightarrow a_n = 59$$

$$a_1, a_2, a_3, \dots = 1, 4, 7, \dots$$

$$a_n = 4n - 1 \rightarrow 4n - 1 < 42 \rightarrow 4n < 43 \rightarrow n < 10.75 \rightarrow n \leq 10$$

$$a_1 + a_2 + a_3 = 21 \rightarrow a_1 + a_1 + d + a_1 + 2d = 3a_1 + 3d = 21 \rightarrow a_1 + d = 7$$

$$a_1 + a_2 + a_3 = 10.5 \rightarrow a_1 + a_1 + 2d + a_1 + 3d = 3a_1 + 5d = 10.5$$

$$3d = 17.5 \rightarrow d = 5.83$$

$$a_2 - a_1 + a_1 \rightarrow a_1 + d - a_1 - d + a_1 = d + a_1 \Rightarrow d + a_1 = 21$$

$$a_1 + d = 21 \times \frac{1}{2} \rightarrow a_1 + d = 10.5$$

$$a_1, a_2, a_3 = 10.5 \rightarrow a_1 + a_1 + d + a_1 + 2d = 3a_1 + 3d = 10.5 \rightarrow a_1 + d = 3.5$$

$$a_2 + a_3 = a_1 + 3d + a_1 + 5d = 2a_1 + 8d = 20$$

$$a_n = 2 + 3(n-1) \rightarrow a_n = 2 + 3(9) \rightarrow a_n = 29$$

$$\begin{aligned} a_1 + d &= 10.5 \\ 2a_1 + 8d &= 20 \\ a_1 + 4d &= 10 \\ (10 - d) + 4d &= 10 \\ 3d &= 0 \\ d &= 0 \\ a_1 &= 10.5 \end{aligned}$$

Arman

$$S_9 = 4S_3$$

$$\frac{9}{2}(a_1 + a_9) = 9\left(\frac{3}{2}(a_1 + a_3)\right) \rightarrow$$

$$\cancel{\frac{9}{2}}(a_1 + a_9) = 3 \times \cancel{\frac{9}{2}}(a_1 + a_3) \rightarrow$$

$$a_1 + a_1 + 11d = 3(a_1 + a_1 + 2d) \rightarrow$$

$$2a_1 + 11d = 4a_1 + 4d \rightarrow 2a_1 = 7d \rightarrow d = \frac{2}{7}a_1$$

$$\frac{a_{10}}{a_7} = \frac{a_1 + 9d}{a_1 + 4d} \rightarrow \frac{a_1 + 9\left(\frac{2}{7}a_1\right)}{a_1 + 4\left(\frac{2}{7}a_1\right)} \Rightarrow \frac{29a_1}{13a_1} = \boxed{\frac{29}{13}}$$

$$a_1 = 11$$

$$a_2 = 23 \rightarrow a_2 = a_1 + 4d \rightarrow 4d = 12 \rightarrow d = 3$$

$$a_n = 11 + 3(n-1) \rightarrow a_8 = 11 + 3(7) \rightarrow a_8 = 32$$

$$b_n = 21, \dots$$

$$b_1 = 21$$

$$b_8 = 23 \rightarrow b_8 = b_1 + (n-1)d \rightarrow 23 = 21 + 7d \rightarrow$$

$$2d = 2 \rightarrow d = 1$$

$$d = 1$$

$$d = \frac{b - a}{n + 1} \rightarrow -d = \frac{12 - 21}{n + 1} \rightarrow -2 = -d - 1$$

$$-d = -1$$

$$d = 1$$

$$n = 7$$