

$$a_n = a_1 + (n-1)d \rightarrow 41 = 40 + (n-1)d \Rightarrow d=1 \rightarrow a_n = 40 + (n-1) \cdot 1 = n + 39$$

$$\rightarrow a_n = n + 39 = 201 \Rightarrow n = 172$$

۱

$$100 \leq 7n - 4 \leq 999 \Rightarrow 104 \leq 7n \leq 1003 \Rightarrow 148.57 \leq n \leq 143.28 \Rightarrow n = 143, 142, \dots, 149$$

$$149 - 143 + 1 = 7$$

۲

$$a_{n+1} + a_{n+2} + a_{n+3} = 3a_{n+2} = -4n + 11 \rightarrow a_{n+2} = -2n + \frac{11}{3} \rightarrow a_{n+2} = -2(n+2) + b = -2n - 4 + b$$

$$\rightarrow b - 4 = \frac{11}{3} \rightarrow b = \frac{25}{3}$$

$$\rightarrow a_n = -2n + 1$$

$$\rightarrow a_{11} + a_1 = -2(11) + 1 - 2(1) + 1 = -38$$

۳

$$a_{13} - a_1 = 12d \Rightarrow 2^9 - 2^0 = 12d \Rightarrow 511 = 12d \Rightarrow d = \frac{511}{12}$$

$$a_1 - a_{13} = -12d \Rightarrow 2^0 - 2^9 = -12d \Rightarrow -511 = -12d \Rightarrow d = \frac{511}{12}$$

$$a_1 + a_{13} = 2^0 + 2^9 = 511$$

۴

$$a_{11} - a_{10} = d \Rightarrow d = 11$$

$$a_{11} = a_{10} + 11d = 10 + 11(11) = 121$$

۵

$$a_1 + a_1 + a_1 + a_1 + a_1 = \frac{1}{4}(a_1 + a_1 + a_1 + a_1 + a_1) \rightarrow 3(S_a) = a_1 + d + a_1 + d + a_1 + d + a_1 + d + a_1 + d$$

$$\rightarrow 3S_a = S_a + 4d \rightarrow 2S_a = 4d \rightarrow \cancel{2} \left(\frac{1}{2} (2a_1 + (n-1)d) \right) \xrightarrow{n=2} d(2a_1 + d) = 10a_1 + 4d$$

$$\rightarrow 10a_1 + 4d = 4d \rightarrow \underline{2a_1 = d}$$

6

$$\frac{a_r}{a_1} = \frac{a_1 + d}{a_1} = \frac{3a_1}{a_1} = \underline{3}$$

$$t_n = t_{n-r} + 1d \rightarrow t_n - t_{n-r} = r d = 1d \rightarrow d = a$$

$$t_1^r - t_d^r = (t_1 + t_d)(t_1 - t_d) = r t_v \times r_0 = r_0 t_v \rightarrow \frac{t_1^r - t_d^r}{t_v} = \frac{r_0 t_v}{t_v} = \underline{r_0}$$

7

$$d = \frac{b-a}{n+1} \rightarrow \frac{\cancel{1} + \sqrt{3} - \cancel{1} + \sqrt{3}}{13} = \frac{13\sqrt{3}}{13} = \underline{\sqrt{3}}$$

$$\frac{1 + \sqrt{3} - (1 - \sqrt{3})}{13 + 1}$$

8

$$d = \frac{b-a}{m+1} \rightarrow d = \frac{32-2}{8-2+1} = \frac{30}{6} = \underline{5}$$

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

$$a_{n+1} = a_1 + nd$$

$$\Rightarrow 9 = \frac{10n}{2n-1} \rightarrow 10n = 18n - 9 \rightarrow \underline{n=3}$$

9 و 10 مابین 9 و 10

9

$$a_n + a_{n+r} = a_r + a_{14} \Rightarrow n + n + r = 14 \rightarrow 2n = 14 \rightarrow n = 7 \rightarrow a_1 + a_{14} = a_r + a_{14} \checkmark$$

$$\rightarrow a_1 = 3a_r \rightarrow a_r + rd = 3a_r \rightarrow 2a_r = rd \rightarrow a_r = \frac{rd}{2} \rightarrow \underline{a_r - \frac{rd}{2} = 0} \rightarrow a_r + rd - \frac{rd}{2} = 0$$

$$\frac{n}{2} = \frac{1}{2} = r$$

$$\underline{a_r = 0}$$

(در صورتی که 9 و 10)

10