

$$t_1 = 40$$

$$t_4 = 41 \rightarrow \frac{t_1 + 3d}{4} = 41 \rightarrow 3d = 21 \rightarrow d = 7$$

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

$$40 + (n-1)7 = 7n + 33$$

$$7n + 33 = 201 \rightarrow 7n = 168 \rightarrow n = 24$$

سوال ۱

$$1.0, 1.08, \dots$$

$$+7$$

$$100 \leq 7n + 3 \leq 999 \rightarrow 97 \leq 7n \leq 996 \rightarrow 13.9 \leq n \leq 142.2 \rightarrow 14 \leq n \leq 142$$

$$142 - 14 + 1 = 129$$

سوال ۲

$$n=0 \rightarrow a_1 + a_2 + a_3 = a_1 + a_1 + d + a_1 + 2d = 3(a_1 + d) \rightarrow 3(a_1 + d) = -4(0) + 12 \rightarrow a_1 + d = 4$$

$$n=1 \rightarrow a_2 + a_3 + a_4 = (a_1 + d) + (a_1 + 2d) + (a_1 + 3d) = 3a_1 + 6d \rightarrow 3(a_1 + 2d) = -4(1) + 12 \rightarrow a_1 + 2d = 8$$

$$\begin{cases} a_1 + 2d = 8 \\ a_1 + d = 4 \end{cases} \rightarrow \frac{a_1 + 2d}{a_1 + d} = \frac{8}{4} \rightarrow a_1 + (-d) = 4 \rightarrow a_1 = 7$$

$$a_{14} + a_{18} = a_1 + 13d + a_1 + 17d = 2a_1 + 30d =$$

$$2(7) + 30(-2) = -46$$

سوال ۳

$$2(r^{x+1}) = r^x - 1 + r^{2x} - 3 \rightarrow r^{x+1} = r^x + r^{2x} - 4 \rightarrow r^x + r^x - r^{x+1} = 4$$

سوال ۴

$$\rightarrow r^x \left(r^x + \frac{1-r^{2x}}{-r} \right) = 4 \rightarrow (r^x)^2 - 3(r^x) - 4 = 0 \rightarrow (r^x - 4)(r^x + 1) = 0 \rightarrow \begin{cases} r^x = -1 \text{ (مردود)} \\ r^x = 4 \rightarrow x = 2 \end{cases}$$

$$(r^2 - 1) + (r^{2+1}) + (r^2 - 3) = 3 + 4 + 13 = 20$$

$$t_{12} = t_{10} + 2d \rightarrow (t_{10} + 2d) - t_{10} = 2d \rightarrow 2d = 10 \rightarrow d = 5$$

سوال ۵

$$t_{12} + t_{10} = t_{11} + 11d + t_{11} + 9d = 2(t_{11} + 10d) = 20 \rightarrow t_{11} + 10d = 10 \rightarrow t_{11} = -10$$

$$t_{11} = t_1 + 10d \rightarrow -10 = t_1 + 10(5) = 50 + t_1 \rightarrow t_1 = -60$$

$$a_1 + a_2 + a_3 + a_4 + a_5 = \frac{1}{5} (a_2 + a_3 + a_4 + a_5 + a_1)$$

سوال ۶

$$5a + \frac{(0+1+2+3+4)}{5}d = \frac{1}{5} [5a + \frac{(1+2+3+4+5)}{5}d] \rightarrow 5(a+2d) = \frac{1}{5} \times 5(a+5d) \times 5 \rightarrow 5a + 10d = a + 5d \rightarrow 4a = -5d$$

$$\frac{a_2}{a_1} = \frac{a_1 + d}{a_1} \rightarrow \frac{a + d}{a} = \frac{5a}{a} = 5$$

$$t_9 - t_{\omega} = (t_9 - t_{\omega})(t_9 + t_{\omega}) \quad \begin{cases} t_9 = t_v + r d \\ t_{\omega} = t_v - r d \end{cases}$$

(٧ سوال)

$$\xrightarrow{t_v} (t_v + r d - t_v + r d)(t_v + r d + t_v - r d) \rightarrow (r d)(r t_v)$$

$$n = r \rightarrow t_r = t_1 + 1\omega = t_1 + r d \rightarrow r d = 1\omega \rightarrow d = \omega$$

$$\frac{r(\omega) \times r t_v}{t_v} = r_0 /$$

$$d = \frac{r + \sqrt{r} - (r - 12\sqrt{r})}{12+1} = \frac{13\sqrt{r}}{13} = \sqrt{r} /$$

b, a ساي بين 1-1, n

$$\hookrightarrow d = \frac{b-a}{n+1}$$

(٨ سوال)

$$0 \xrightarrow{b-1, n} 0 \hookrightarrow n+r d \Rightarrow a_{n+r} = a_1 + \frac{(n+r-1)d}{n+1}$$

$$r + n d = 11 \quad (11: \text{sin } 1, 1) \quad (9 \text{ سوال})$$

$$n d = 9$$

$$r r = r + \frac{r n - r}{r n - r + 1} d \rightarrow r_0 = r n d - r d$$

$$\Rightarrow r_0 = r(9) - r d \rightarrow r d = 9 \rightarrow d = r$$

$$n d = 9 \rightarrow r n = 9 \rightarrow \underline{n = 3 /}$$

$$a_n + a_{n+r} = a_r + a_{14} \rightarrow n + (n+r) = r + 14 \rightarrow 2n = 14 \rightarrow n = 7$$

(١٠ سوال)

$$a_n = r a_r \rightarrow a + n d = r(a + r d)$$

$$a + (n-1)d = 0$$

$$a + n d = r a + r^2 d$$

$$(-d) + n d - d = 0$$

$$r a = -r d \rightarrow a = -d$$

$$n d - r d = 0 \rightarrow n d = r d \rightarrow \underline{n = r /}$$