

$$t_1 = 40$$

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

$$d = 7$$

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

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

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

سوال (۱)

$$1.0, 1.08, \dots$$

$$+v$$

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

$$142 - 14 + 1 = 129$$

سوال (۲)

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

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

سوال (۳)

$$\begin{cases} a_1 + 2d = 4 \\ a_1 + d = 8 \end{cases} \rightarrow \frac{a_1 + 2d}{a_1 + d} = \frac{4}{8} \rightarrow a_1 + (-d) = 4 \rightarrow a_1 = 6$$

$$a_{14} + a_{18} = a_1 + 14d + a_1 + 18d = 2a_1 + 32d =$$

$$2(6) + 32(-2) = -50$$

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

سوال (۴)

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

$$\begin{cases} r^x = -1 \text{ (مردود)} \\ r^x = 4 \rightarrow x = 2 \end{cases}$$

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

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

سوال (۵)

$$t_{12} + t_{10} = t_1 + 11d + t_1 + 9d = 2(t_1 + 10d) = 20 \rightarrow t_1 + 10d = 10 \rightarrow t_1 = -10$$

$$t_{12} = t_1 + 10d \rightarrow -10 + 10(5) = 40$$

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

سوال (۶)

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

$$2a = d$$

$$\frac{a_2}{a_1} = \frac{a_1 + d}{a_1} \rightarrow \frac{a + 2a}{a} = \frac{3a}{a} = 3$$

$$t_9 - t_{\omega} = (t_9 - t_{\omega})(t_9 + t_{\omega}) \quad \begin{cases} t_9 = t_v + 2d \\ t_{\omega} = t_v - 2d \end{cases}$$

(٧ سوال)

$$\xrightarrow{t_v} (t_v + 2d - t_v + 2d)(t_v + 2d + t_v - 2d) \rightarrow (4d)(2t_v)$$

$$n=4 \rightarrow t_4 = t_1 + 1\omega = t_1 + 2d \rightarrow 2d = 1\omega \rightarrow d = \omega$$

$$\frac{4(\omega) \times 2t_v}{t_v} = 8$$

$$d = \frac{2 + \sqrt{3} - (2 - 12\sqrt{3})}{12+1} = \frac{12\sqrt{3}}{13} = \sqrt{3}$$

b, a ساي بين 1-1, n

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

(٨ سوال)

$$0 \xrightarrow{b-1, n} 0 \rightarrow n+2d \Rightarrow a_{n+2} = a_1 + \frac{(n+2-1)d}{n+1}$$

$$2 + nd = 11 \quad (11: 5 \text{ ين } 1, 2) \quad (9 \text{ سوال})$$

$$nd = 9$$

$$32 = 2 + \frac{(n-2)}{n-1}d \rightarrow 30 = (n-2)d$$

$$\Rightarrow 30 = 2(9) - 2d \rightarrow 2d = 4 \rightarrow d = 2$$

$$nd = 9 \rightarrow 2n = 9 \rightarrow n = 4.5$$

$$a_n + a_{n+2} = a_r + a_{14} \rightarrow n + (n+2) = 3 + 14 \rightarrow 2n = 14 \rightarrow n = 7$$

(١٠ سوال)

$$a_n = 3a_r \rightarrow a + 7d = 3(a + 2d)$$

$$a + 7d = 3a + 6d$$

$$2a = -d \rightarrow a = -\frac{d}{2}$$

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

$$(-\frac{d}{2}) + nd - d = 0$$

$$nd - 2d = 0 \rightarrow nd = 2d \rightarrow n = 2$$