پاسخ سوالات دهم دفتر 63

۲۰ آفرین به شما

۱) $\{۱\},\{۲,۳,۴\},\{۵ \ldots\}, \ldots ,\{۶۵, \ldots ,۸۱\}$

دسته ۹ام ← آخری $= ۹^۲$ ، آخری دسته قبلی $n^2 = ۶۴$

دسته ۹ام ← بین اولی $= ۶۵ \Longrightarrow \frac{۸۱+۶۵}{۲} = ۷۳$

۲

۲) $\{۱,۲,۳\},\{۴,۵, \ldots ,۱۲\},\{۱۳, \ldots ,۳۹\},\{۴۰, \ldots ,۱۲۰\},\{۱۲۱, \ldots ,۳۶۳\} \Longrightarrow \frac{۳۶۳+۱۲۱}{۲} = \boxed{۲۴۲}$

۲

۳)

$a_1 \to 3k+1 \to k=0 \Rightarrow 4$ $\qquad a_5 \to 3k+2 \to k=1 \Rightarrow 1+a$

$a_2 \to 3k+2 \to k=0 \Rightarrow 1+a$ $\qquad a_6 \to 3k \to k=2 \Rightarrow 4$

$a_3 \to 3k \to k=1 \to 2$ $\qquad a_7 \to 3k+1 \to k=2 \Rightarrow 0$

$a_4 \to 3k+1 \to k=1 \to 2$ $\qquad a_8 \to 3k+2 \to k=2 \Rightarrow 2+a$

$a_9 \to 3k \to k=3 \to 8$

(چون صفر هم هست) $a_0 \to 3k \to k=0 \to 2^0=1$

$4+1+a+2+2+1+a+4+0+2+a+8+1=19 \to 25+3a=19$

$\to \boxed{a=-2} \to a_2, a_5, \ldots, a_{29} \to 3k+2 \to -1+0+0+0$
$+0+0+0+0+0 = \boxed{-1}$

۲

۴) $t_n = an^2+bn+c \xrightarrow[a_5=14]{a=\frac{1}{70}(-a_5)} a=-\frac{1}{5} \Rightarrow t_n = -\frac{1}{5}n^2+bn+c$

$t_5=14 \Rightarrow -\frac{1}{5}(5^2)+b(5)+c=14 \to 5b+c=19$ $\qquad b=4,\ c=-1$

$t_7=17.2 \Rightarrow -\frac{1}{5}(7^2)+b(7)+c=17.2 \to 7b+c=27$

۲

$t_n = -\frac{1}{5}n^2+4n-1 \Rightarrow t_{15} \div t_1 = 14 \div \frac{14}{5} = \boxed{5}$

۵

$$\begin{cases} a_4 = b_2 \\ a_1+3d = b_1+d' \\ a_8 = b_7 \\ a_1+7d = b_1+6d' \end{cases} ,\ b_{10}=0 \quad \frac{b_{15}}{d} = \frac{b_1+14d'}{d} \Rightarrow \frac{b_{10}+5d'}{d} = \frac{5d'}{d} = ?$$

۲

$$a_8 - a_4 = b_7 - b_2$$

$$4d = 5d' \Rightarrow \frac{d'}{d} = \frac{4}{5}$$

$$5 \times \frac{4}{5} = 4$$

۶

$$a_2 = x \longrightarrow 9x^2 = \overbrace{5\underbrace{(x+d)(x-d)}_{x^2-d^2}}^{5x^2-5d^2} + \underbrace{3x(x-d)}_{3x^2-3dx}$$

۲

$$\Rightarrow 2x^2 - 3dx - 5d^2 = 0 \longrightarrow x = \frac{+3d \pm \sqrt{9d^2+40d^2}}{4},\quad = 49d^2 \quad \begin{cases} \frac{10}{4}d \\ -d \end{cases}$$

$$a_4 = a_2 + 2d \begin{cases} \frac{10}{4}d + 2d = 4.5d \rightarrow \frac{4.5d}{d} = 4.5 \\ -d + 2d = d \rightarrow \frac{d}{d} = 1 \end{cases}$$

حسابی

c, b, a ($+d$)

۷

$b = c+d$

$a = c+2d$

هندسی $\rightarrow \frac{c}{4}, \frac{a}{2}, b \xrightarrow{\text{جابجایی}} -\frac{1}{3}d, \frac{1}{4}d, -\frac{1}{4}d$

$4-1=3$

۲

$$\frac{c}{4}, \frac{c+2d}{2}, c+d \xrightarrow{\text{هندسی}} (c+d)\left(\frac{c}{4}\right) = \left(\frac{c+2d}{2}\right)^2$$

$$\frac{c^2}{4} + \frac{dc}{4} = \frac{c^2+4d^2+4cd}{4}$$

$$\cancel{c^2}+dc = \cancel{c^2}+4d^2+4dc \rightarrow -4d^2 = +3cd \rightarrow c = \frac{-4}{3}d$$

$\boxed{9 - 1 - \frac{4}{3} - 2}$ جواب

هندسی a, b, c → $\frac{b}{q}, b, bq$

$$\frac{a_4}{a_1} = q^3 = -64 \qquad -4^3 = -64$$

۸

حسابی $\longrightarrow c, 2a, 3b$

$$\frac{b}{q}, 2bq, 3b \rightarrow 2bq - \frac{b}{q} = 3b - 2bq$$

$$4bq - \frac{b}{q} = 3b$$

$$\frac{4bq^2 - b}{q} = 3b$$

$$4bq^2 - b = 3bq$$

$$4bq^2 - 3bq - b = 0$$

$$q = \frac{+3b \pm \sqrt{9b^2+16b^2} = 25b^2}{8b} \quad \begin{cases} 1 \\ -\frac{1}{4} \end{cases}$$

۹)

$$\frac{a_1 q^5}{(a_1 q)^3} + \frac{a_1 q}{(a_1)^2} = 2 \to \frac{q^2}{a_1^2} + \frac{a_1 q}{a_1^2} = 2$$

$$a_1 q + q^2 = 2a_1^2 \quad a_1 q + q^2 - 2a_1^2 = 0$$

۲

$$q = \frac{-a_1 \pm \sqrt{a_1^2 + 8a_1^2}}{2} \begin{cases} a_1 \to a_2 = a_1^2 \\ -2a_1 \to a_2 = -2a_1^2 \end{cases}$$

$$\begin{cases} \frac{a_1^2}{a_1^2} = 1 \\ \frac{a_1^2}{-2a_1^2} = -\frac{1}{2} \end{cases}$$

۱۰)

$$t_5 = 27 \to aq^4 = 27$$

۲

$$t_3 = \sqrt{t_4} \to aq^2 = \sqrt{aq^3} \xrightarrow{\text{توان ۲}} a^2q^4 = aq^3 \to aq = 1 \Rightarrow a = \frac{1}{q}$$

$$q^4 \times \frac{1}{q} = 27$$

$$q^3 = 27 \to q = 3 \to a = \frac{1}{q} = \frac{1}{3}$$

$$\frac{1}{2} - \frac{1}{3} = \frac{1}{6}$$