

1. $\frac{9\omega + 11}{7} = \boxed{17}$ ✓

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2. $(1, 3), (2, 13), (3, 29), (4, 51), (5, 79)$

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$\frac{29 \times 3 + 13}{4} = \boxed{24}$ ✓

نفس

3. $a_1 + a_2 + a_3 + a_4 + a_5 + a_6 + a_7 + a_8 + a_9 + a_{10} = 1 + 1 + 2 + 2 + 1 + 1 + 2 + 2 + 1 + (-1) = 17$

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$22 + 2a = 19 \rightarrow a = -1$

$a_1 + a_2 + a_3 + \dots + a_{19} = 0 + 0 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 = \boxed{1}$

4. $a_\omega = 1f$
 $a_v = 1v, r$
 $\begin{cases} \frac{1}{\omega} \times (-f) = \frac{-1}{\omega} \\ \frac{1}{v} \times (-r) = \frac{-1}{v} \end{cases}$

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$\begin{cases} -\omega + \omega b + c = 1f & (-1) \\ -f + vb + c = 1v, r \end{cases} \rightarrow \begin{cases} +\omega - \omega b - c = -1f \\ -f + vb + c = 1v, r \end{cases}$

$\frac{a_{1\omega}}{a_1} = \frac{1f}{\frac{1f}{D}} = \frac{1f \times \omega}{1f} = \boxed{\frac{f\omega}{v}}$

$v(f) + c = 2v \rightarrow c = -1$

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5. $\begin{pmatrix} m_f = n_r \\ m_n = n_v \end{pmatrix} \omega a$
 $\omega a = f d$
 $a = \frac{f}{\omega} d$
 $h_{1\omega} = h_{10} + \omega a = 0 + \omega a = \omega \times \left(\frac{f}{\omega} d\right) = \boxed{f d}$

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6. $9a_r = \omega a_f a + r a_v a \rightarrow 9(a+d)^r = \omega(a+rd)a + r(a+d)a$

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$9a_r, 9d^r + 1rad = \omega a^r + 10ad + rad + rad$

$\Rightarrow \frac{9a^r}{a} + \frac{9d^r}{d} = \omega + r \rightarrow a = \frac{-d + \sqrt{f^2 d^2}}{f} = \frac{r}{f} d$

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$\frac{a^r}{d} = \frac{a + rd}{d} = \frac{\frac{r}{f} d + rd}{d} = \frac{r}{f} + r = \boxed{\frac{r(f+1)}{f}}$

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Case C, b, a $\rightarrow$ a, a+d, a+2d $\therefore r_{\text{avg}} = \frac{b}{a} = \frac{a+b}{2} = \frac{r(-\frac{1}{2}b+b)}{2}$

$$\frac{c}{r}, \frac{a}{r}, b \rightarrow \frac{a}{r}, \frac{a+d}{r}, a+d$$

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

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

$$r = \frac{a}{\frac{r}{c}} = \frac{ra}{c} \Rightarrow r = \frac{b}{\frac{a}{c}} = \frac{rb}{a} \Rightarrow \frac{ra}{c} = \frac{rb}{a} \Rightarrow ar = br$$

$$\Rightarrow ar + br + cb = ar + ab \quad \text{mit } (a+rb)^r = (a+b)a$$

$$\Rightarrow (br + rab) = 0 \Rightarrow b(rb + ra) = 0 \quad \text{mit } b=0$$

$$rb = ra \Rightarrow a = \frac{c}{r} b \quad \checkmark$$

Gleichung $\frac{r_b + c}{r} = 1 \Rightarrow a = \frac{r_b + c}{r}$ $\textcircled{1}$ ^
 $a \cdot r = b + c \textcircled{2}$ $(r_b + c) \cdot r = c \cdot r$ $\textcircled{1} \cdot r$ ^

$$\Rightarrow \frac{r}{c} b c + \frac{1}{c} c r = b^2 \Rightarrow b^2 - \frac{r c}{c} b + \frac{c r}{c} = 0 \Rightarrow b = \frac{\frac{r c}{c} \pm \sqrt{\left(\frac{r c}{c}\right)^2}}{\frac{r c}{c}}$$
$$q = \frac{b}{c} = \frac{\frac{r c \pm \omega c}{\Lambda}}{\frac{r c}{c}} = \frac{r \pm \omega}{\Lambda} = \frac{1}{\gamma} \quad \checkmark$$
$$\frac{a_q}{a_y} = q^r = \left(\frac{1}{\gamma} \right)^r = \frac{1}{\gamma^r}$$

$$\frac{a_q}{(a_q)^r} + \frac{a_r}{(a_r)^r} = r \rightarrow \frac{a_q}{a_q^r} + \frac{a_r}{a_r^r} = r \Rightarrow \frac{q}{a^r} + \frac{q}{a} = r$$

15 $\frac{q}{a} = a^1$ $r^1 + a^1 - r = 0 \Rightarrow a^1 = 1 - r$

$\frac{a^r}{a^r} = \frac{a^r}{a^q} = \frac{a}{q} = \frac{1}{a^1} = \frac{1}{1-r}$

سوال ۸. ابتدا برعکس یعنی محبات
عوضه بودیم. حالا حل را برات نوشتم

[illegible]

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$a_0, a_3, a_4, a_9 \rightarrow$ ضابطی اول $(2)^k$

$a_1, a_2, a_7 \rightarrow$ ضابطی دوم $(-2k+2)$

$a_2, a_5, a_8 \rightarrow$ ضابطی سوم $\left[\frac{n}{k+2}\right] + a$

$a_0 = 2^0$ $a_0 = 1$	$a_3 = 2^1$ $a_3 = 2$	$a_4 = 2^2$ $a_4 = 4$	$a_9 = 2^3$ $a_9 = 8$
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$a_1 = -2(0) + 2$ $a_1 = 2$	$a_2 = -2(1) + 2$ $a_2 = 0$	$a_7 = -2(2) + 2$ $a_7 = -2$
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$a_2 = \left[\frac{2}{2}\right] + a$ $a_2 = a + 1$
$a_5 = \left[\frac{5}{2}\right] + a$ $a_5 = a + 1$
$a_8 = \left[\frac{8}{2}\right] + a$ $a_8 = a + 2$

$$S_{10} = 1 + 2 + a_2 + 2 + 2 + a_5 + 0 + 0 + a_8 + 8 = 19$$

$$a_2 + a_5 + a_8 = -2 \rightarrow 3a + 4 = -2 \rightarrow \boxed{a = -2}$$

مجموع صوابات $a_2 + a_5 + \dots$ از ضابطی سوم بدست می آید

$$a_n = \left[\frac{2k+2}{k+2}\right] + (-2)$$

$$a_n = \left[\frac{2k+2+k-2}{k+2}\right] - 2 = \left[2 + \frac{k-2}{k+2}\right] - 2 = \boxed{\left[\frac{k+2}{k-2}\right]}$$

عبارت $\left[\frac{k+2}{k-2}\right]$ به ازای $k=0$ و $k=1$ برابر ۱- است و به ازای سایر مقادیر k برابر ۰ است پس داریم:

$$S = a_2 + a_5 + a_8 + \dots + a_{29}$$

$$S = (-1) + (-1) + 0 + \dots + 0 = \boxed{-2}$$

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$$t_n = an^2 + bn + c \rightarrow t_5 = 25a + 5b + c = 14$$

$$\rightarrow t_7 = 49a + 7b + c = 17, 2$$

$$\xrightarrow{\text{کم کردن}} 12a + b = 1, 4$$

$$a = \frac{-1}{12} (-t_5) = \frac{1}{12} (-14) = -\frac{1}{2} \rightarrow 12\left(-\frac{1}{2}\right) + b = 1, 4 \rightarrow$$

$$b = 4$$

$$a = -\frac{1}{2} \text{ و } b = 4$$

$$t_5 = -14 \rightarrow 25\left(-\frac{1}{2}\right) + 4(5) + c = 14 \rightarrow \boxed{c = -1}$$

$$t_{15} = 15^2\left(-\frac{1}{2}\right) + 15(4) - 1 = 14$$

$$t_1 = -\frac{1}{2}(1)^2 + 4(1) - 1 = 2, 8$$

$$\rightarrow \frac{t_{15}}{t_1} = \frac{14}{2, 8} = \boxed{5}$$

V

$$a, b, c \xrightarrow{\text{صافی}} b = \frac{a+c}{2} \rightarrow a = 2b - c$$

$$b, \frac{a}{2}, \frac{c}{2} \xrightarrow{\text{هندس}} \frac{a^2}{2} = \frac{bc}{2} \rightarrow a^2 = bc \rightarrow bc = (2b-c)^2$$

$$4b^2 + c^2 - 4bc = bc \rightarrow 4b^2 - 4bc + c^2 = 0 \quad (b-c)(4b-c) = 0$$

$$b=c \rightarrow \text{عقار!} \quad \text{صیغہ متوازن!}$$

$$2b=c \rightarrow \text{ق ق} \checkmark \rightarrow \frac{a+2b}{2} = b \rightarrow a = -2b$$

$$\text{دنبہ} \rightarrow b, \frac{a}{2}, \frac{c}{2} \rightarrow b, -b, b \rightarrow q = -1$$

$$2q = -2$$

سوال ۸

$$\text{دنبہ ہندس} \rightarrow a, aq, aq^2 \quad (a, b, c)$$

$$\text{دنبہ صیغہ} \rightarrow 3aq, 2a, aq^2 \quad (2b, 2a, c)$$

$$\text{واضح ہے} \quad 3aq + aq^2 = 2a \xrightarrow{\div a} 3q + q^2 = 2 \rightarrow q = 1 \quad \times \quad \text{صیغہ متوازن}$$

$$\rightarrow q = -2 \quad \checkmark$$

$$q = -2 \rightarrow \frac{aq}{a4} = \frac{aq^2}{aq^4} = q^2 = (-2)^2 = 4$$