

عدد آخر هر دسته: (شماره آخر) $9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 97, 99$

عدد اول هر دسته: $1 + (شماره قبلی)$

$$1 + 1^2 = 45$$

$$\frac{11 + 45}{2} = \frac{134}{2} = 67$$

دسته پنجم: $\{121, \dots, 343\}$ دسته چهارم: $\{40, \dots, 121\}$ دسته سوم: $\{29, \dots, 121\}$ دسته دوم: $\{12, \dots, 40\}$ دسته اول: $\{3, \dots, 12\}$

میانگین اعداد دسته ی پنجم: $\frac{121 + 343}{2} = \frac{464}{2} = 232$

ضابطه اول: $n = 2k \rightarrow a_1 = 1, a_3 = 3, a_5 = 5, a_7 = 7, a_9 = 9, \dots$

ضابطه دوم: $n = 2k + 1 \rightarrow a_1 = 4, a_3 = 2, a_5 = 0, a_7 = -2, a_9 = -4, \dots$

ضابطه سوم: $n = 2k + 2 \rightarrow a_1 = -1, a_3 = 1, a_5 = 3, a_7 = 5, a_9 = 7, \dots$

جمع این ضابطه ها: $S_{10} = 1 + 4 + (1+5) + 2 + (1+5) + 4 + \dots + 10k$
 $n = 19$

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

اگر $k=0$ عبارت برابر ۱- اما در بقیه هر صفره است (۲-)

$$a_n = a_1 n^2 + b n + c \Rightarrow a_1 = -\frac{1}{10}, a_2 = 1, a_3 = 3, a_4 = 5, a_5 = 7, a_6 = 9, a_7 = 11, a_8 = 13, a_9 = 15, a_{10} = 17, a_{11} = 19, a_{12} = 21, a_{13} = 23, a_{14} = 25, a_{15} = 27, a_{16} = 29, a_{17} = 31, a_{18} = 33, a_{19} = 35$$

$$12a + b = 1, 4 \Rightarrow b = 4$$

$$a = \frac{1}{10} \times (-14) = -\frac{1}{5} = -0,2$$

$$a_5 = 25 \times -\frac{1}{5} + 4 + c = 14 \Rightarrow c = -1 \Rightarrow t_{10} = 10 \times 10 \times -\frac{1}{5} + 40 \times -1 = -14$$

$$a_1 = b_1 \Rightarrow a_1 + 12a = b_1 \Rightarrow 12a = b_1 - a_1 \Rightarrow b_n = a_n + b$$

$$b = \frac{b_{10} - a_{10}}{10} = \frac{15 - (-14)}{10} = \frac{29}{10} = 2,9$$

$$\begin{aligned}
 & \gamma a_r' = \omega a_r a + r a_r a \Rightarrow 4(a+r d)' = \omega (a+r d) a + r (a+r d) a \\
 & \Rightarrow 4a' + 4rd + 4d' = \omega a' + \omega a d + r a d + r a' \\
 & \Rightarrow -r a' - \omega a d + 4d' = 0 \Rightarrow a' - \omega d - r d' = 0 \Rightarrow (a - r d)(a + r d) = 0 \\
 & \begin{aligned} & \rightarrow a = \frac{\omega d}{-r} = -\frac{\omega}{r} d \\ & \rightarrow a = \frac{r d}{-r} = -d \end{aligned} \\
 & \frac{a}{d} = \begin{cases} -\frac{r d + \omega d}{d} = 1 \\ 1, \omega d + r d = r d \end{cases} \Rightarrow \frac{a}{d} = 1
 \end{aligned}$$

$$\begin{aligned}
 & b = \frac{a+c}{r} \\
 & \left(\frac{a}{r}\right)' = \frac{a'}{r} = \frac{b}{r} \Rightarrow a' = b c \\
 & a = b, \frac{a}{r}, \frac{c}{r} \Rightarrow a = b, \frac{c}{r} \Rightarrow \frac{c}{r} \\
 & q = -1 \Rightarrow r \times (-1) = -r \\
 & a' = \frac{a+c}{r} \times c \Rightarrow a' = \frac{ac+c^2}{r} = r a' - ac - c^2 = 0 \\
 & a' - ac - r c' = 0 \Rightarrow (a - r c)(a + r c) = 0 \\
 & a = \frac{r c}{r} = c \quad \text{or} \quad a = -\frac{c}{r}
 \end{aligned}$$

$$\begin{aligned}
 & r a = \frac{r(a+c)}{r} \Rightarrow r a = r b + c \Rightarrow a = \frac{r b + c}{r} \\
 & b' = a c \Rightarrow b' = \frac{r a c + c^2}{r} \Rightarrow r b' - r b c + c^2 = 0 \\
 & (r b - r c)(r b + \frac{c}{r}) = 0 \Rightarrow b = c \quad \text{or} \quad b = -\frac{1}{r} c \\
 & q = \frac{c}{r} = -r \Rightarrow \frac{a q}{a q} = 2^r \Rightarrow (-r)^r = -4^r \\
 & \text{or} \quad b = -\frac{1}{r} c
 \end{aligned}$$

$$\begin{aligned}
 & \frac{\sigma q^2}{a q^2} = \frac{\sigma q^2}{a q^2} + \frac{\sigma q}{a r} = r \Rightarrow \frac{a'}{a r} + \frac{a q}{a r} = r \Rightarrow a' + a q = r a' \\
 & \Rightarrow r a' - a q - q^2 = 0 \Rightarrow a' - a q - \frac{q^2}{r} = 0 \Rightarrow (a - \frac{q}{r})(a + \frac{q}{r}) = 0 \\
 & \begin{aligned} & \rightarrow a = \frac{q}{r} \Rightarrow a = q \\ & \rightarrow a = -\frac{q}{r} \Rightarrow a = -\frac{q}{r} \end{aligned} \\
 & \frac{a'}{a q} = \frac{a}{q} \Rightarrow a = q = 1 \\
 & a = \frac{1}{r} q = \frac{1}{r}
 \end{aligned}$$

$$\begin{aligned}
 & \left. \begin{aligned} a_r &= \sqrt{a r} \\ a &= r \end{aligned} \right\} \Rightarrow a \omega a r = a r \Rightarrow r \sqrt{a r} = \sqrt{a r} \Rightarrow r = \sqrt{a r} \\
 & q = \frac{a}{r} = \frac{a}{\sqrt{a}} = \sqrt{a} \\
 & a = a_1 q^2 \Rightarrow q = a_1 \times r \Rightarrow a_1^2 \frac{1}{r^2} \Rightarrow \frac{1}{r} = a_1^2 \frac{1}{r} \Rightarrow a_1^2 = \frac{1}{r} \\
 & a_1 = \frac{1}{\sqrt{r}}
 \end{aligned}$$