

① دسته اول:

④ دسته دوم: ۲ ۳

⑨ دسته سوم: ۵ ۶ ۷ ۸

⋮

دسته هشتم: --- ⑫

دسته نهم: ۷۵ --- ⑪ $\rightarrow \frac{۸۱+۷۵}{۲} = ۷۸$

۱

دسته اول: ۱, ۲, ۳

دسته دوم: ۴, ۵, ..., ۱۲

دسته سوم: ۱۳, ..., ۳۹

دسته چهارم: ۴۰, ..., ۱۲۰

دسته پنجم: ۱۲۱, ..., ۳۹۳ $\rightarrow \frac{۳۹۳+۱۲۱}{۲} = ۲۵۷$

باتوجه به اینکه در دنباله حسابی میانگین هر دو عدد متوالی میانگین آن دو عدد است.

۲

$$a_0 + a_1 + a_2 + \dots + a_a = 1 + 4 + 1 + a + 2 + 2 + 1 + a + 4 + 2 + a + 1 = 2a + 3a$$

$$\rightarrow 2a + 3a = 19$$

$$a = -2 \rightarrow a_2 + a_5 + \dots + a_{19} = \left[\frac{1}{2} \right] - 2 + \left[\frac{5}{2} \right] - 2 + \left[\frac{9}{2} \right] - 2 + \left[\frac{13}{2} \right] - 2 + \left[\frac{17}{2} \right] - 2 + \left[\frac{21}{2} \right] - 2 +$$

$$\left[\frac{25}{2} \right] - 2 + \left[\frac{29}{2} \right] - 2 + \left[\frac{33}{2} \right] - 2 + \left[\frac{37}{2} \right] - 2 + \left[\frac{41}{2} \right] - 2 = -2$$

۳

$$\text{ضریب درجه دوم} = \frac{1}{x^2} \cdot \frac{-14}{1} = \frac{-1}{\omega} \rightarrow \frac{-x^2}{\omega} + bx + c = 0 \quad b=4, c=-1 \rightarrow \frac{-x^2}{\omega} + 4x - 1$$

$$f(0) = 14 = \frac{-0^2}{\omega} + \omega b + c \Rightarrow \omega b + c = 19$$

$$f(1) = 17, 2 = \frac{-1^2}{\omega} + 1b + c \Rightarrow 1b + c = 27$$

$$b=4$$

$$b=4 \rightarrow c=-1$$

$$\frac{a_{15}}{a_1} = \frac{-4\omega + 7 \cdot -1}{-1 + 4 - 1} = \frac{14}{2} = 7$$

$$\rightarrow \frac{a_{15}}{a_1} = 7$$

۴

$$a_n + b = t_n \rightarrow t_u - t_r = \omega a$$

$$a_n = a_1 + (n-1)d \rightarrow a_n - a_r = (n-r)d$$

$$\omega a = 4d$$

$$10a + b = 0 \rightarrow 10d + b = 0 \rightarrow 10d = -b$$

$$\frac{t_{15}}{d} = \frac{15a + b}{d} = \frac{15d + (-10d)}{d} = \frac{5d}{d} = 5$$

۵

$$r_{\text{union}} \rightarrow a_0 + (n-1)d = a_n$$

$$7(a_0 + d)^r = 5(a_0 + rd)(a_0) + 3(a_0 + d)(a_0) \rightarrow 7a^r + 7d^r + 14ad = 5a^r + 5ad + 3a^r + 3ad$$

$$14a^r + 14ad - 7d^r = 0$$

$$\frac{a^r}{d} = -\frac{rd + d^r}{d} = \textcircled{1}$$

$$\frac{a^r}{d} = \frac{rd + d^r}{d} = \frac{r}{1} = \textcircled{r, d}$$

$$a = \frac{-d \pm \sqrt{d^2 - 4(-7d^r)(r)}}{r}$$

$$a = \frac{-d \pm \sqrt{d^2}}{r} \rightarrow a = \frac{r}{1}d \rightarrow a = rd$$

$$\Delta \sigma^2$$

$$r_{\text{union}} \rightarrow \left. \begin{array}{l} rb = a + c \\ c = rb - a \end{array} \right\} r_{\text{union}} \rightarrow \frac{a^r}{r} = \frac{bc}{r}$$

$$a^r = bc$$

$$\rightarrow a^r = (rb - a)b = rb^r - ab \rightarrow a^r + ab - rb^r = 0$$

$$\rightarrow a = \frac{-b \pm \sqrt{b^2 + 4b^r}}{r} = \frac{-b \pm rb}{r} \rightarrow a = -rb \rightarrow q = \frac{b}{a} = \frac{b}{-rb} = -1$$

$$a = b \rightarrow r_{\text{union}} \rightarrow \textcircled{-r}$$

$$r_{\text{union}} \rightarrow Fa = rb + c \quad r_{\text{union}} \rightarrow b^r = ac$$

$$c = Fa - rb \rightarrow b^r = (Fa - rb)a = Fa^r - rab \rightarrow Fa^r - rab - b^r = 0$$

$$\rightarrow a = \frac{rb \pm \sqrt{r^2b^2 + 4b^r}}{r} = \frac{rb \pm ab}{r} \rightarrow a = \frac{rb}{r} = a = b \textcircled{r}$$

$$a = -\frac{b}{r} \rightarrow q = \frac{b}{a} = \frac{b}{-\frac{b}{r}} = -r$$

$$\frac{t_9}{t_7} = q^r \rightarrow (-r)^r = \textcircled{-7r}$$

$$\frac{aq^a}{a^r q^r} + \frac{aq}{a^r (aq^r)} = r \rightarrow \frac{q^r}{a^r} + \frac{aq}{a^r} = \frac{q(q+a)}{a^r} = r \rightarrow ra^r = aq + q^r$$

$$\rightarrow q^r + aq - ra^r \rightarrow q = \frac{-a \pm \sqrt{a^2 + 4a^r}}{r} = \frac{-a \pm ra}{r} \rightarrow q = -ra$$

$$q = +a$$

$$\frac{a^r}{aq} = \frac{a}{q} \rightarrow \frac{a}{-ra} = \textcircled{-\frac{1}{r}} \quad \frac{a}{q} = \frac{a}{+a} = \textcircled{+1}$$

$$t_{\mu} = \sqrt{t_r} \rightarrow aq^r = \sqrt{aq^r} \xrightarrow{r_{\text{union}}} \frac{a^r q^r}{aq^r} = \frac{aq^r}{aq^r} \rightarrow aq = t_r = 1$$

$$t_{\omega} = q^r = aq \cdot q^r = r_{\text{union}} \rightarrow q^r = r_{\text{union}} \rightarrow q = r_{\text{union}} \xrightarrow{aq=1} a_i = \frac{1}{r_{\text{union}}}$$

$$\frac{1}{r} - a_i = \frac{1}{r} - \frac{1}{r_{\text{union}}} = \frac{r_{\text{union}} - r}{r} = \textcircled{\frac{1}{r}}$$