

$$a_1=1, a_2=4, a_3=9 \rightarrow a_n=n^2 \rightarrow a_9=81 \rightarrow a_{10}=10^2=100$$

$$a_n [4, 9, \dots, 81] \rightarrow \frac{81+4}{2} = 42.5$$

$$\begin{matrix} (1) & (2) & (3) \\ [1, 2, 3] & [2, 4, 6, 2, 3] & [3, 4, 5, 6, 7, 1, 2, 3] \end{matrix} \Rightarrow \text{اعداد را به مضرب ۳ با شیب}$$

$$\begin{matrix} (4) & (5) \\ [4, 5, 6, 7, 8, 9, 10, \dots, 12] & [10, 9, 8, \dots, 1, 2, 3] \end{matrix} \Rightarrow \text{میانگین} = \frac{10+1}{2} = \frac{11}{2} = 5.5$$

$$\begin{aligned} 2^k &\Rightarrow n=1, 2, 3, 4, k=1, 2, 3, 4 \quad -2k+4 \Rightarrow n=1, 2, 3, 4, k=1, 2, 3, 4 \\ \left[\frac{n}{k+1} \right] + a &\Rightarrow n=1, 2, 3, 4, k=1, 2, 3, 4 \quad \Rightarrow a_1+a_2+a_3+\dots+a_n = (a_1+a_2+a_3+a_4) + (a_1+a_2+a_3) + \dots + (a_1+a_2+a_3) \\ (1, 2, 3, 4) + (1, 2, 3) + \frac{1}{2} + a + \frac{1}{3} + a + \frac{1}{4} + a &= 11a + 10 = 19 \Rightarrow a = 1 \\ \Rightarrow \left[\frac{2k+1}{k+1} \right] - 2 &\Rightarrow \left[\frac{2(k+1)-1}{k+1} \right] - 2 = \left[2 - \frac{1}{k+1} \right] - 2 = -1 + \frac{1}{k+1} \\ a_1+a_2+\dots+a_{10} &= \left(1 - \frac{1}{2}\right) + \left(1 - \frac{1}{3}\right) + \dots + \left(1 - \frac{1}{11}\right) = 10 - \frac{1}{11} \end{aligned}$$

$$\begin{aligned} a_n &= -\frac{1}{n} n^2 + b n + c \\ \frac{a_n}{n} &= -n + b + \frac{c}{n} \\ \frac{a_{10}}{10} &= -10 + b + \frac{c}{10} \\ \frac{a_1}{1} &= -1 + b + c \\ \Rightarrow \begin{cases} 10b + c = 9 \\ b + c = 0 \end{cases} \Rightarrow \begin{cases} 9b = 9 \\ b = 1 \\ c = -1 \end{cases} \\ a_n &= -n + n - 1 = -1 \\ \Rightarrow \frac{a_{10}}{a_1} &= \frac{-1}{-1} = 1 \end{aligned}$$

$$\begin{aligned} a &= \text{مستقیم} \quad b = \text{خطی} \\ a_p &= b_r, a_n = b_r \\ a + rd &= pb + q, a + rd = pb + q \\ \Rightarrow b_1, n=1 \Rightarrow 10b + q = 1 \Rightarrow q = 1 - 10b \\ \Rightarrow \frac{10b + q}{10} &= \frac{1 - 10b + 1 - 10b}{10} = \frac{2 - 20b}{10} = \frac{1 - 10b}{5} \end{aligned}$$

$$a_f = a + d, a_w = a + rd, a_E = a + r^2d$$

$$(a+d)^r = a(a+rd)a + r(a+d)a = 4(a^r + rad + d^r) = a(a^r + rad), r(a^r + ad)$$

$$4a^r + rad + 4d^r = 4a^r + 4rd \Rightarrow rad + 4d^r = 4rd \Rightarrow rad - 4d^r = 0 \Rightarrow r\left(\frac{a^r}{d^r}\right) + \frac{a}{d} - 4 = 0 \Rightarrow \frac{a}{d} = x$$

$$\Rightarrow a^r + x - 4r = 0 \Rightarrow x < \frac{4}{r} \quad , \quad \frac{a_f}{d} = \frac{a+rd}{d} = \frac{a}{d} + r = x + r < \frac{4}{r} + r = \frac{4 + r^2}{r}$$

$$\frac{C}{F}, \frac{A}{V}, B \Rightarrow \frac{\frac{A}{V}}{\frac{C}{F}} = \frac{B}{\frac{A}{V}} \Rightarrow \frac{FA}{C} = \frac{VB}{A} \Rightarrow A^r = BC^*$$

$$B = aq, C = aq^r \Rightarrow A^r = (aq)(aq^r) = aq^r = a^r \Rightarrow 1 = q^r$$

$$r q = r$$

$$b^r = a^r \Rightarrow (ra - r) = (rc - ra) \Rightarrow ra - rc = 0 \Rightarrow a = c^*$$

$$\Rightarrow b^r = a^r \Rightarrow b = a \Rightarrow A^r = \frac{aq}{aq^r} = \frac{q}{q^r} = q^r = 1 \Rightarrow q = 1$$

$$\frac{a_f}{a_v^r} = \frac{aq^w}{(aq)^r} = \frac{aq^w}{a^r q^r} = \frac{q^r}{a^r} \quad , \quad \frac{a_f}{(a)^r} = \frac{aq}{a^r} = \frac{q}{a} \Rightarrow \frac{q}{a} = x$$

$$x + x = r \Rightarrow x + x - r = 0 \quad \begin{matrix} x=1 \\ x=r \end{matrix} \Rightarrow \frac{a^r}{a^r} = \frac{a^r}{aq^r} = \frac{a}{q} = \frac{1}{q} = \frac{1}{x}$$

$$a_w = \sqrt{a_f}, a_w = rV \Rightarrow aq^r = rV \Rightarrow \frac{1}{q} q^r = q^r = rV \Rightarrow q = r, a = \frac{1}{r}$$

$$(aq^r = \sqrt{aq^r})^r = a^r q^r = aq^r \Rightarrow aq = 1 \Rightarrow a = \frac{1}{q}^*$$

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