

۱۸, ۲۵

شماره: ۱۵

کلاس: دهم سرانده

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۱- $a-d$ و a و $a+d$ از شرط مجموع 21 : $a+(a+d)=21+(a-d)$ $3a=21$
 $a=7$
 از شرط دوم: $a \times (a+d) = 6 \times (a-d) \rightarrow a(a^2-d^2) = 6 \times 4$
 حاصل ضرب $6 \times 4 = 24$
 $7 \times d^2 = 24 - 49$ $d^2 = -25$ $d = 5$ (نویسیت)
 $3a+3d=21 \rightarrow a+d=7$ $a(a+d)(a+2d)=6 \times 4$
 $a \times 7 \times (a+2d) = 6 \times 4$; $a+d=7$

$d=7-a$ پس $a \times 7 \times (a+2(7-a)) = 6 \times 4$ $a \times 7 \times (14-a) = 6 \times 4$
 $98a-7a^2=24$ $7a^2-98a+24=0$ $q+4+4q=21$ $q+4q=17$ $4q^2=17q+4$
 $q = \frac{17 \pm \sqrt{289-64}}{7} = \frac{17 \pm \sqrt{225}}{7} = \frac{17 \pm 15}{7}$ $4q^2-17q+4=0$
 $q=4$ $q=\frac{1}{4}$ q باید ضریب باشد!

۲- $(x^2)^2 = (x^2+2)(x^2-2)$ $x^4 = x^4 - 2x^2 + 2x^2 - 4$
 $x^4 = x^4 + 2x^2 - 4$ $x^4 - 2x^2 - 4 = 0$ $y = x^2$
 $y^2 - 2y - 4 = 0$ $y = 4$ $y = -2$ $x = \pm 2$ و $x^2 = 4$ $y = x^2 \geq 0$ پس $x = \pm 2$
 $a_1 = 4+2=6$ $a_2 = 4$ $a_3 = 2$ $q = \frac{1}{4}$ $x=2$ برابر

$a_1 = 6$ $a_2 = -4$ $a_3 = 2$ $q = -\frac{1}{4}$ x برابر $x=-2$
 $S_V = a_1 \times \frac{1-q^V}{1-q} = 6 \times \frac{1-(\frac{1}{4})^V}{1-\frac{1}{4}} = 6 \times \frac{1-\frac{1}{4^V}}{\frac{3}{4}} = 6 \times \frac{1-\frac{1}{4^V}}{\frac{3}{4}}$
 $S_V = 6 \times \frac{1-\frac{1}{4^V}}{\frac{3}{4}} \times 2 = \frac{1-\frac{1}{4^V}}{\frac{1}{4}}$ $\checkmark$

$\frac{1-q^a}{1-q} = \frac{121}{\Delta 1}$ $\Delta 1(1-q^a) = 121(1-q)$ $\Delta 1 - \Delta 1 q^a = 121 - 121 q$
 $- \Delta 1 q^a + 121 q - 121 = 0$ $\Delta 1 q^a - 121 q + 121 = 0$

افزون $q = \frac{1}{4}$
 $1 + \frac{1}{4} + \frac{1}{16} + \frac{1}{64} + \frac{1}{256} = 1$ $\Rightarrow a_1 = 256 - a_2 = 256 \times \frac{1}{4} = 64$ $-a_3 = 16 \times \frac{1}{4}$
 $= 256 \times \frac{1}{4} = 64 - a_4 = 64 \times \frac{1}{4} = 16$
 $S_\infty = a_1 \frac{1-q^a}{1-q} = 256 \times \frac{1-\frac{1}{4^a}}{\frac{3}{4}} = 256 \times \frac{1-\frac{1}{4^a}}{\frac{3}{4}} \times \frac{4}{3} = 363 \checkmark$

$a_1 = 1$ $a_V = a_1 + S d$ $S d = 63$
 $a_V = 64$ $A = a_1 + S d = 1 + 63 \times \frac{1}{4} = 1 + \frac{63}{4} = \frac{67}{4}$ $\frac{67}{4} = 16.75$ $\checkmark$
 $a_V = 16 \times 4$ $q^3 \leq 64$ $B = a_1 - a_1 \times q^3 = 1 \times 2^3 = 8$ $\checkmark$
 حالت دوم: $q = -\frac{1}{4}$
 $B = -8 \rightarrow A+B = 24, 5$ $\checkmark$
 $32, 5 + 8 = 40, 5 = A+B$ $\checkmark$
 جواب

$$a_1 = -2, a_2 = -\frac{1}{2}, d = a_2 - a_1 = 0.5$$

$$a_{101} = a_1 + 100d = -2 + 100(0.5) = 48$$

$$-2 + 48 = 1 \quad a_{101} = 48$$

(2)

$$c_n = 1 \quad c_1 = 1.28$$

جبرهای هندسی برای c

$$c_n = b_1 r^n = 1.28 r^n = 1 \quad r = (c - 1)^{\frac{1}{n}} = r^{-1} = \left(\frac{1}{r}\right) = 0.5 \quad \checkmark$$

$$a_n = a_1 + (n-1)d \quad (a_n)^2 = a_1^2 + 2a_1d + d^2 \quad a_2 = a_1 + d$$

$$a_2 = a_1 + d \quad a_4 = a_1 + 3d \quad (a_1 + 3d)^2 = (a_1 + d)(a_1 + d)$$

$$a_1^2 + 12a_1d + 9d^2 = a_1^2 + 10a_1d + 16d^2$$

$$a_1^2 + 12a_1d + 9d^2 = a_1^2 + 10a_1d + 16d^2 \quad 2a_1d + 20d^2 = 0$$

$$a_1 + 10d = 0 \Rightarrow -\frac{a_1}{10} = d = 0 \quad \checkmark$$

$$a_n = a_1 + (n-1)d \quad a_2 = a_1 + d \quad a_4 = a_1 + 3d \quad a_8 = a_1 + 7d$$

$$(a_2)^2 = a_4 \times a_8 \quad (a_1 + d)^2 = (a_1 + 3d)(a_1 + 7d)$$

$$a_1^2 + 2a_1d + d^2 = a_1^2 + 10a_1d + 21d^2$$

$$\rightarrow -2a_1d + 20d^2 = 0 \quad d \neq 0 \quad d = a_1$$

$$a_n = a_1 + (n-1)d = a_1 + (n-1)a_1 \quad a_1 = na_1 \quad a_2 = 2a_1 \quad a_4 = 4a_1$$

$$b_1 = \frac{1}{r} \quad b_2 = a_2 = 2a_1 \quad b_4 = a_4 = 4a_1 \quad \frac{b_2}{b_1} = \frac{b_4}{b_2} = r$$

$$r = \frac{b_2}{b_1} = \frac{2a_1}{\frac{1}{r}} = 2a_1 \quad a_1 = \frac{1}{r} \quad r = 2a_1 = 2$$

$$b_n = b_1 \times r^{n-1} \quad b_{10} = \frac{1}{r} \times r^9 = \frac{1}{2} \times 512 = 256 \quad b_{10} = 256 \quad \checkmark$$

$$b_1, b_2 = b_1 r, b_3 = b_1 r^2$$

$$3b_2 + 2b_3 = 2b_1 \Rightarrow 2 \times (2b_1) + 2 \times (4b_1) = 2b_1$$

$$2 \times (2b_1 r) + 2 \times (4b_1 r^2) = 2b_1 \quad 4r + 8r^2 = 2 \quad 2r + 4r^2 = 1$$

$$\Rightarrow 2r(2r^2 - 1) = 0 \quad r = 0 \text{ or } r = \frac{1}{2} \text{ or } r = -\frac{1}{2}$$

$$d = a_2 - a_1 = \frac{1}{r} - 2 = \frac{1}{2} - 2 = -\frac{3}{2}$$

$$a_2 = 2 - \frac{3}{2} = \frac{1}{2} \quad a_1 = 2 - \frac{1}{2} = \frac{3}{2}$$

$$\frac{a_2}{a_1} = \frac{a_4}{a_2} = r \quad \frac{1/2}{3/2} = r \quad r = \frac{1}{3}$$

$$T_1 = a_1 + (n-1)d = \frac{3}{2} + (n-1)(-\frac{3}{2}) = \frac{3}{2} - \frac{3(n-1)}{2}$$

$$t_2 = a_1 + (n-1)d = \frac{3}{2} - \frac{3(n-1)}{2} = \frac{3}{2} - \frac{3n-3}{2} = \frac{6-3n+3}{2} = \frac{9-3n}{2}$$

$$b_2 = b_1 r \quad b_3 = b_1 r^2 \quad b_4 = b_1 r^3$$

$$d = b_3 - b_2 = b_1 r^3 - b_1 r^2 = b_1 r^2(r-1)$$

$$b_4 = a_1 + 3d = b_1 + 3d$$

$$b_1 r^3 = b_1 + 3d \quad b_1 r^3 = b_1 + 3(b_1 r^2(r-1))$$

$$b_1 r^3 = b_1 + 3b_1 r^3 - 3b_1 r^2 \quad r^3 = 1 + 3r^3 - 3r^2 \quad r^3 - 3r^3 + 3r^2 = 1 \quad -2r^3 + 3r^2 = 1$$

$$x = \frac{a_1 + 3d}{r} = \frac{1}{r} = 1 \quad r = 1 \quad d = a_2 - a_1 = 1 - 1 = 0 \quad \checkmark$$

$$x = \frac{a_1 + 3d}{r} = 1 \Rightarrow r = 1 \quad b_1(1+r^2+r^3) = 1$$

$$a_1 = b_1 = 1 \quad a_2 = b_2 = b_1 r = 1 \times 1 = 1$$