

19

تکلیف شماره ۱۹

رابطه کلیه

۱۱

$$a_1 \cdot a_2 = a_3 = 24$$

$$r^2 = 24 = 4^3 \Rightarrow a_2 = 4$$

(۲)

$$a_1 + a_2 + a_3 = 21$$

$$a_1 + 4 + 16 = 21 \Rightarrow a_1 = 1$$

$$a_1(1 + 4^2) = 17$$

$$\frac{a_2}{q} + a_2 q = 17$$

$$a_2 \times q + a_2 q^2 = 17q$$

$$4 + 16q - 17q = 0$$

$$q^2 - 17q + 12 = 0$$

$$(q - 12)(q - 1) = 0 \Rightarrow q = 12 \text{ (X)} \rightarrow \text{حل ر. هند غیر حسابی است یا}$$

$$q = \frac{1}{12} \text{ (✓) ✓}$$

۱۱

$$(x^2 + 2)(x^2 - 2) = 2x^2$$

$$\Rightarrow x^4 - 2x^2 + 2x^2 - 4 = 2x^2$$

$$x^4 - 2x^2 - 4 = 0$$

(۲)

$$(x^2 - 2)(x^2 + 2) = 0 \Rightarrow x^2 = 2 \Rightarrow x = \pm \sqrt{2}$$

$$x^2 = -2x$$

$$x = \sqrt{2} \Rightarrow \Delta, 2, 2 \Rightarrow \Delta = \frac{1}{2} \left(\frac{1}{2} \sqrt{2} - 1 \right) = \frac{1}{2} \left(\frac{1}{\sqrt{2}} - 1 \right)$$

$$x = -\sqrt{2} \Rightarrow \Delta, -2, 2 \text{ (X)} \rightarrow \text{چون } q > 0$$

$$\Delta \left(\frac{\frac{1}{2} \sqrt{2}}{\frac{1}{2} \sqrt{2}} \right) = \frac{\Delta \times 12}{44} \text{ (✓) (دقت!)} \left(\frac{12}{8} \right)$$

$$S_{\omega} = a_1 + a_2 + a_3 + a_4 + a_5 = a_1 + q + q^2 + q^3 + q^4 + a_5 \quad (2)$$

$$= a_1 (1 + q + q^2 + q^3 + q^4)$$

$$\frac{1}{1-q} \times \frac{1-q^5}{1-q} = \frac{1-q^5}{1-q} \quad (2)$$

$$d = \frac{q^5 - 1}{\omega + 1} = \frac{q^5}{\omega + 1}$$

$$A = a_1 + \omega d = 1 + \frac{q^5 \times \omega}{\omega + 1} = \frac{q^5 \omega}{\omega + 1}$$

$$B = a_1 + q^5 d = 1 + \frac{q^{10} \times \omega}{\omega + 1} = \frac{q^{10} \omega}{\omega + 1}$$

$$q^{\omega+1} = \frac{q^5}{1} = q^5 \Rightarrow q = \pm 1 \Rightarrow B = 1 \rightarrow A + B = \frac{q^5 \omega}{\omega + 1} + 1 = \frac{q^5 \omega + \omega + 1}{\omega + 1} = \frac{q^5 \omega + \omega + 1}{\omega + 1}$$

$$B = -1 \rightarrow A + B = \frac{q^5 \omega}{\omega + 1} - 1 = \frac{q^5 \omega - \omega - 1}{\omega + 1}$$

$$a_{1,1} = b_n$$

$$b_1, b_2, \dots$$

$$b_{2n}, b_{2n+1}, \dots$$

$$a_1, a_2, \dots$$

$$-2q, -q^5$$

$$d = a_2 - a_1 = \frac{-q^5}{2} + 2q = \frac{1}{2}$$

$$\Rightarrow a_{1,1} = a_1 + 1 \cdot d = -2q + 2q = 1 = b_n = a_1 q^5 = 1 \times q^5$$

$$\Rightarrow q = \frac{1}{2} \rightarrow a_2 = \frac{1}{2}$$

$$\Rightarrow q = \frac{1}{2} \rightarrow a_2 = \frac{1}{2}$$

2) $\rightarrow$ $a_r = b_r = a_1 + r d$
 $a_r = b_r = a_1 + r d$
 $a_n = b_n = a_1 + n d$ } $b_1 \cdot b_n = b_r^2$ (2)
 $= (a_1 + r d) (a_1 + n d)$
 $= (a_1 + r d)^2$

$$\Rightarrow a_1^2 + 2a_1 r d + r^2 d^2 = a_1^2 + 2a_1 r d + r^2 d^2$$

$$\Rightarrow r \cdot d^2 = -2a_1 d \Rightarrow$$

$$r \cdot d^2 + 2a_1 d = 0$$

$$r d (d + 2a_1) = 0 \Rightarrow \boxed{d = 0} \checkmark$$

$$\begin{aligned} \Rightarrow & 1 \cdot d + 2a_1 = 0 \Rightarrow \\ & 1 \cdot d = -2a_1 \end{aligned}$$

$$\boxed{d = -\frac{1}{2} a_1} \checkmark$$

3) $\rightarrow$ $a_r = b_r = a_1 + d$
 $a_r = b_r = a_1 + d$
 $a_n = b_n = a_1 + n d$ } $b_1 \cdot b_n = b_{r+1}^2$ (2)
 $\Rightarrow (a_1 + d) (a_1 + n d)$

$$= (a_1 + r d)^2$$

$$\Rightarrow a_1^2 + 2a_1 d + n d^2 = a_1^2 + 2a_1 d + n d^2$$

$$b_n = a_1 + n d = r d \Rightarrow 2a_1 d = r d^2$$

$$b_{n+1} = a_1 + (n+1) d = r d$$

$$\begin{aligned} \Rightarrow & r d^2 - 2a_1 d = 0 \\ & r d (d - 2a_1) = 0 \Rightarrow d = 0 \text{ (1)} \end{aligned}$$

$$b_n = b_1 \cdot r \cdot \frac{b_{n+1}}{b_1} = \frac{r d}{r d} = r a_1$$

$$\Rightarrow d = a_1$$

۱) حسابی
 $3a_r = b_x$
 $4a_r = b_{x+1}$
 $a_x = b_{x+2}$

۲)
$$\frac{b_x + b_{x+2}}{2} = b_{x+1}$$

$$\Rightarrow 3a_r + a_x = 4a_r$$

$$3a_1 + a_1 = 4a_1$$

$$4(1+4^r) = 4a_1 4^r$$

$$4 + 4^r = 4a_1$$

$$\Rightarrow 4^r - 4a_1 + 4 = 0$$

$$= 4(4 - 4)(4 - 1) = 0$$

$$\Rightarrow 4 = 4 \checkmark$$

$$\Rightarrow 4 = 1 \times$$

دنباله هندسی غیر ثابت

۹۱

$a_1, a_2, \dots$

$2, \frac{5}{2}, \dots \Rightarrow a_2 - a_1 = d$

حسابی

$$\Rightarrow a_x + x = b_y = \frac{5}{2} - 2 = -\frac{1}{2}$$

$$a_1 + x = b_y = \frac{5}{2} + x$$

$$a_2 + x = b_{y+1} = \frac{1}{2} + x$$

$$a_{12} + x = b_{y+2} = -1 + x$$

$$\left. \begin{array}{l} b_y \cdot b_{y+2} = (b_{y+1})^2 \\ (\frac{5}{2} + x)(-1 + x) = (\frac{1}{2} + x)^2 \end{array} \right\}$$

جواب: $-4, -2, -\frac{25}{4} \Rightarrow a_1 = \frac{25}{4}$

$$\Rightarrow \frac{5}{2} + \frac{5}{2}x - x + x^2 = (\frac{1}{2} + x)^2 \rightarrow x = -\frac{21}{4}$$

$$= x^2 + \frac{1}{12} + \frac{1}{2}x$$

$$\Rightarrow (\frac{5}{2} + \frac{1}{12}) = \frac{1}{2}x$$

$$\frac{b_{y+1} - a_1}{b_y - a_1} = \frac{\frac{1}{2} - \frac{25}{4}}{\frac{5}{2} - \frac{25}{4}} = \frac{1}{2}x$$

$$\Rightarrow x = \frac{-\frac{21}{4}}{\frac{1}{2}} = -\frac{21}{2}$$

ببره تکلیف نه چرک نویس!

(۲)

۱۵۱

حسابی
 $a_1 = b_1$
 $a_2 = b_2$
 $a_3 = b_3$

$a_1 + a_2 + a_3 = 2a_1 \Rightarrow b_1 + b_2 + b_3 = 2b_1$
 $\Rightarrow 3b_1 = 2b_1 \Rightarrow b_1 = 0$

$b_1 + b_2 + b_3 = \sqrt{2}$

$\Rightarrow b_1 + b_2 + b_3 = \sqrt{2}$

$\Rightarrow \frac{\sqrt{2}}{3} + \frac{\sqrt{2}}{3} + \frac{\sqrt{2}}{3} = \sqrt{2}$

حسابی
 $a_1 = b_1 = a_1$

$a_2 = b_2 = a_1 + d$
 $a_3 = b_3 = a_1 + d$
 $b_1 + b_2 + b_3 = \sqrt{2} \Rightarrow a_1 + a_1 + d + a_1 + a_1 + d = \sqrt{2}$
 $3a_1 + 2d = \sqrt{2}$

$a_1 + (a_1 + d) = (a_1 + d) + d$

$a_1 + a_1 + d = a_1 + a_1 + d + d$

$a_1 + d = d \Rightarrow d - a_1 = 0$

$d(d - a_1) = 0$

$\Rightarrow d = 0$
 $\Rightarrow d = a_1$

$2a_1 + 2d = \sqrt{2}$

$\sqrt{2}a_1 = \sqrt{2} \Rightarrow a_1 = 1$

$d = 0$

$d = 0$

دارای دو جواب