

تکلیف شماره ۱۵

رابطه کلی

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

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

$$a_1 + a_2 + a_3 = 21$$

~~$$a_1 + a_2 + a_3 = 21 \Rightarrow a_1 + 4 + 4^2 = 21$$~~

~~$$a_1 + 4 + 16 = 21$$~~

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

$$\frac{a_1}{4} + a_2 \cdot 4 = 17$$

$$a_1 \times a_2 \cdot 4^2 = 17 \cdot 4$$

$$4 + 16 \cdot 4 = 0$$

$$4^2 + 17 \cdot 4 + 12 = 0$$

$$(4 - 17)(4 - 1) = 0 \Rightarrow 4 = 17 \text{ (X)} \rightarrow \text{حل عدد غیر حسابی است یا}$$

$$4 = \frac{1}{4} \text{ (✓)}$$

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

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

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

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

$$x^2 = -2 \Rightarrow x = \pm \sqrt{-2}$$

$$x = \sqrt{2} \Rightarrow \Delta, 2, 2 \Rightarrow \Delta = \frac{1}{2} \left(\frac{1}{2} \cdot 1^2 - 1 \right) = \frac{1}{2} \left(\frac{1}{4} - 1 \right) = -\frac{3}{4}$$

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

$$\Delta \left(\frac{\frac{1}{2} \cdot 1^2}{\frac{1}{2} \cdot 1} \right) = \frac{\Delta \cdot 1^2}{\frac{1}{2}} = \frac{1 \cdot \Delta}{\frac{1}{2}} = 2\Delta$$

$$w_1 \quad S_w = a_1 + a_2 + a_3 + a_4 + a_5 = a_1 + a_1 q + a_1 q^2 + a_1 q^3 + a_1 q^4$$

$$= 9(1 + 4 + 4^2 p + 4^3 + 4^4)$$

$$\mu \frac{r}{\cancel{r}} \times \frac{r}{\cancel{r}} \frac{1}{\cancel{A}} \quad \text{---} \quad \mu \frac{r}{\cancel{r}} \frac{1}{\cancel{A}}$$

$$d = \frac{45-1}{\omega+1} = \frac{44}{5}$$

هندسی: $\overset{1}{(a_1)}$ a_2 a_3 $\overset{2}{(a_4)}$ a_5 $\overset{24}{(a_6)}$
 $13 = a_1 a_2 a_3$

$$q^{\omega+1} = \frac{48}{1} = 48 = 4^r \Rightarrow 4 = \pm 2 \Rightarrow \begin{matrix} 4=2 \\ B=1 \end{matrix} \rightarrow A+B = 32\omega + 1 = 321\omega$$

$$\begin{matrix} 4=-2 \\ B=-1 \end{matrix} \rightarrow A+B = 32\omega - 1 = 319\omega$$

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$$\omega) \quad a_{1,1} = b_n$$

$$b_1, b_2, \dots$$

$$Lr_n, b_r, \dots$$

$$a_1, a_2, \dots$$

$$d = a_2 - a_1 = \frac{-90}{2} + 12 = \frac{1}{2}$$

$$\Rightarrow a_{1,1} = a_{1,1} \cdot 1 = -r\epsilon + r\omega = 1 = b_{1,1} = a_{1,1} \cdot q^1 = r\epsilon \cdot x q^1$$

$$\Rightarrow 4^y = \frac{1}{4x}$$

$$\Rightarrow \frac{1}{4^y} = 4x$$

$$\Rightarrow 4 = x^{-y}$$

2) $\begin{cases} a_r = b_r = a_1 + rd \\ a_r = b_r = a_1 + rd \\ a_r = b_r = a_1 + rd \end{cases} \Rightarrow b_1 \cdot b_r = b_r^r$

$$= (a_1 + rd)(a_1 + rd)$$

$$= (a_1 + rd)^r$$

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

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

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

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

$$\Rightarrow \begin{cases} r d + a_1 = 0 \\ r d = -a_1 \end{cases}$$

$$\boxed{d = \frac{-1}{r} a_1}$$

3) $\begin{cases} a_r = b_r = a_1 + d \\ a_r = b_r = a_1 + rd \\ a_r = b_r = a_1 + rd \end{cases} \Rightarrow b_1 \cdot b_{r+1} = b_{r+1}^r$

$$\Rightarrow (a_1 + r) (a_1 + rd)$$

$$= (a_1 + rd)^r$$

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

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

$$b_{r+1} = a_1 + rd = rd$$

$$\Rightarrow r^2 d^2 - (a_1 + d) = 0$$

$$r^2 d^2 - (a_1 + d) = 0 \Rightarrow d = 0$$

$$b_r = b_1 \cdot b_{r+1} = b_r^r$$

$$\Rightarrow \frac{b_{r+1}}{b_r} = \frac{rd}{rd} = r a_1$$

$$\Rightarrow \frac{b_{r+1}}{b_r} = r a_1$$

$$\Rightarrow \frac{rd}{rd} = r a_1$$

$$\Rightarrow 1 = r a_1$$

$$\Rightarrow r a_1 = 1$$

$$\Rightarrow a_1 = \frac{1}{r}$$

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هندسی $3a_r = b_x$ حسابی

$a_r = b_{x+1}$

$a_{\varepsilon} = b_{x+2}$

$$\left. \begin{array}{l} 3a_r = b_x \\ a_r = b_{x+1} \\ a_{\varepsilon} = b_{x+2} \end{array} \right\} \frac{b_x + b_{x+2}}{2} = b_{x+1}$$

$$\Rightarrow 3a_r + a_{\varepsilon} = 4a_r$$

$$3a_1 + a_4 = 4a_2$$

$$9 + 16 = 4 \times 5$$

$$25 = 20$$

$$\Rightarrow 9^2 - 4a + 25 = 0$$

$$= 2(9 - 2)(4 - 1) = 0$$

$$\Rightarrow 9 = 2$$

$$\Rightarrow 4 = 1 \quad (\times)$$

دنباله هندسی غیر ثابت ✓

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$$a_1, a_r, \dots$$

$$r, \frac{v}{\varepsilon}, \dots \Rightarrow a_{\varepsilon} - a_1 = d$$

هندسی $= \frac{v}{\varepsilon} - r = -\frac{1}{\varepsilon}$

حسابی $\Rightarrow a_{\varepsilon} + x = b_y = \frac{\omega}{\varepsilon} + x$

$$a_1 + x = b_{y+1} = \frac{1}{\varepsilon} + x$$

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

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

$$= (\frac{1}{\varepsilon} + x)^2$$

$$\Rightarrow -\frac{\omega}{\varepsilon} + \frac{\omega}{\varepsilon}x - x + x^2$$

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

$$\Rightarrow (\frac{\omega}{\varepsilon} + \frac{1}{12}) = \frac{1}{\varepsilon}x$$

$$\frac{b_{y+1} - a_1}{b_y - a_1} = \frac{\frac{\omega}{\varepsilon} + \frac{1}{12}}{\frac{\omega}{\varepsilon}} = \frac{1}{\varepsilon}x$$

$$\Rightarrow x = \frac{\frac{\omega}{\varepsilon} + \frac{1}{12}}{\frac{1}{\varepsilon}} = \frac{-21}{22}$$

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

$a_1 + a_2 + a_3 = 2a_1 \Rightarrow b_1 + b_2 + b_3 = 2b_1$
 $\Rightarrow 2b_1 = b_2 + b_3$
 $\Rightarrow 2b_1 = \sqrt{r}$
 $b_1 = \frac{\sqrt{r}}{2}$

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

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

$\frac{\sqrt{r}}{2} + \frac{\sqrt{r}}{2} + b_3 = \sqrt{r}$

$\Rightarrow \frac{\sqrt{r}}{2} + \frac{\sqrt{r}}{2} + b_3 = \sqrt{r}$

حسابی
 $a_1 = b_1 = a_1$

$a_2 = b_2 = a_1 + d$
 $b_1 + b_2 + b_3 = \sqrt{r} \Rightarrow a_1 + a_1 + d + a_1 + a_1 + d = \sqrt{r}$

$a_1 = b_3 = a_1 + d \rightarrow b_1 + b_2 + b_3 = \sqrt{r} \Rightarrow 2a_1 + 1 \cdot d = \sqrt{r}$

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

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

$a_1 + d = d^2 \Rightarrow d^2 - a_1 + d = 0$

$d(d - a_1 + 1) = 0$

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

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

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

$d = 0$

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$d = 0$