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سؤال اول:

$$\frac{a}{q} \times a \times aq = a^3 = 14 \Rightarrow a = 14$$

$$\left(\frac{14}{q} + 14 + 14q = 11\right)q = 14 + 14q + 14q^2 = 11q \Rightarrow 14q^2 - 14q + 14 = 0$$

$$\Delta = b^2 - 4ac = (-14)^2 - 4(14 \times 14) = 196 - 784 = -588$$

$$\Rightarrow q = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{14 \pm \sqrt{-588}}{28} = \frac{14}{28} \pm \frac{\sqrt{-588}}{28} = \frac{1}{2} \pm \frac{\sqrt{-147}}{7}$$

$$\Rightarrow \text{مقدور نیست} \Rightarrow q = \frac{1}{2}$$

$$(14n)^3 = (14n^2 + 14)(14n^2 - 14) = 14n^4 = 14 + 14n^4 - 14$$

$$\Rightarrow 14n^4 - 14n^2 - 14 = 0 \Rightarrow (14n^2 - 14)(n^2 + 1) = 0$$

$$\Rightarrow 14n^2 - 14 = 0 \Rightarrow n = \pm 1$$

$$n = 1 \rightarrow 14 \times 1^2 \times 1^2 = 14 \rightarrow a = 14, q = \frac{1}{2} \Rightarrow 3u = 14 \left(\frac{1 - (\frac{1}{2})^3}{1 - \frac{1}{2}} \right)$$

$$n = -1 \rightarrow 14 \times (-1)^2 \times (-1)^2 = 14$$

$$= 14 \left(1 - \frac{1}{14} \right) = 14 \times \frac{13}{14} = 13$$

$$3u = a_1 + a_1q + a_1q^2 + a_1q^3 + a_1q^4 \rightarrow 3u(1 + q + q^2 + q^3 + q^4)$$

$$\Rightarrow 3u = 14 \times \frac{13}{14} = 13$$

$$q = \frac{4F}{1} \rightarrow 4F = q^4 \Rightarrow q = \sqrt[4]{4F}$$

سوال ۸۴

$$1 \leq 2 \leq 3 \leq 4 \leq 5 \leq 6 \leq 7 \leq 8 \leq 9 \leq 10 \leq 11 \leq 12 \leq 13 \leq 14 \leq 15 \leq 16 \leq 17 \leq 18 \leq 19 \leq 20 \leq 21 \leq 22 \leq 23 \leq 24 \leq 25 \leq 26 \leq 27 \leq 28 \leq 29 \leq 30$$

$$a_1 = \frac{q^4 - 1}{q + 1} = 1 + q + q^2 + q^3$$

$$1 \leq 11, 12 \leq 22 \leq 32 \leq 42 \leq 52 \leq 62 \leq 72 \leq 82 \leq 92 \leq 102 \leq 112 \leq 122 \leq 132 \leq 142 \leq 152 \leq 162 \leq 172 \leq 182 \leq 192 \leq 202 \leq 212 \leq 222 \leq 232 \leq 242 \leq 252 \leq 262 \leq 272 \leq 282 \leq 292 \leq 302$$

$$A + B = \begin{cases} 12, 13 + 14 = 26, 15 \\ 12, 13 - 14 = -1, 15 \end{cases}$$

$$\frac{-95}{12} = -7, 13, 15$$

$$\Rightarrow -12 \leq -13, 15 \leq \dots$$

سوال ۵۳

$$\Rightarrow d \geq \frac{1}{r}$$

$$a_n = -12 + (n-1) \frac{1}{2} \Rightarrow a_{101} = -12 + 100 \times \frac{1}{2} = 38$$

$$a q^V = 1 \Rightarrow a \geq 128 \Rightarrow a^V \geq \frac{1}{128} \Rightarrow q \geq \frac{1}{2}$$

$$(a+2d) \leq (a+4d) \leq (a+6d)$$

سوال ۹۴ (۱)

$$\Rightarrow (a+4d)^2 = (a+2d)(a+6d) = a^2 + 12ad + 12ad = a^2 + 10ad + 14d^2$$

$$10ad^2 + 14da = 0 \Rightarrow 14d(10d + a) = 0 \Rightarrow d = 0$$

$$10d = -a \Rightarrow d = -\frac{a}{10}$$

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قاب قبول
چون منفی است

$$(a+d) \leq (a+vd) \leq (a+vd)$$

$$\Rightarrow (a+vd)^2 = (a+d)(a+vd) \Rightarrow a^2 + 2adv + d^2 = a^2 + a + ad + vd^2$$

$$\Rightarrow 2adv - ad - vd^2 = 0 \Rightarrow d(d-a) = 0 \Rightarrow d=0 \text{ یا } a=d \checkmark$$

$$G_{\text{جاذبه}} = \frac{1}{2} \epsilon d \leq \frac{1}{2} \epsilon d \leq \frac{1}{2} \epsilon d \dots \Rightarrow d = \frac{\Lambda d}{\epsilon d} \quad (2)$$

$$t_0 = t_1 \times q^4 \times \frac{1}{K} \times r^4 = \frac{r^4}{K} \times r^4 = \frac{r^8}{K}$$

$$K a_1 r \leq K a_1 r \leq a_1 \epsilon \Rightarrow r(K a_1 r) = a_1 \epsilon + K a_1 r$$

$$\Rightarrow K a_1 r = a_1 \epsilon + K a_1 r \Rightarrow r(a_1 q^2) = a_1 q^2 + K(a_1 q)$$

$$\Rightarrow K a_1 q^2 = a_1 q^2 + K a_1 q \Rightarrow a_1 q^2 + K a_1 q - K a_1 q^2 = 0$$

$$\Rightarrow a_1 q (q^2 - Kq + K) = 0 \Rightarrow a_1 q \neq 0 \Rightarrow q^2 - Kq + K = 0$$

$$\Rightarrow (q-1)(q-K) = 0 \Rightarrow \begin{cases} q=1 \Rightarrow \text{غیرممکن} \\ q=K \checkmark \end{cases}$$

$$\frac{\Lambda}{K} \leq \frac{V}{K} \leq \dots \Rightarrow t_n = \frac{\Lambda}{K} + (n-1)x - \frac{1}{K}$$

$$\rightarrow -\frac{1}{K}$$

$$\Rightarrow t_F = \frac{\Lambda}{K} + Kx - \frac{1}{K} = \frac{\Lambda}{K}$$

$$t_A = \frac{\Lambda}{K} + Vx - \frac{1}{K} = \frac{1}{K}$$

$$t_{\text{معه}} = \frac{\Lambda}{K} + 12x - \frac{1}{K} = \frac{-K}{K} = -1$$

$$\Rightarrow \left(\frac{1}{K} + m\right)^2 = \left(\frac{\Lambda}{K} + m\right)(-1+m) = \frac{1}{14} + m^2 + \frac{1}{K}m = m^2 + \frac{1}{K}m - \frac{\Lambda}{K}$$

$$\frac{1}{K}m - \frac{1}{K}m = -\frac{\Lambda}{K} - \frac{1}{14} \Rightarrow \frac{1}{K}m = \frac{-\Lambda-1}{14} = \frac{-21}{14} \Rightarrow m = -\frac{21}{14}$$

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