

پاسخ تشریحی کنکور تجربی ۹۹

درس ریاضه

تهیه و تنظیم: مهندس تقی زاده

(دیر دیستان مشکات، آموزشگاههای قلم خلاق و نیکو - تبریز)

@taghizadeh_math

 **TAGHIZADEH**

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$$\sqrt{8} + \sqrt{12} = 2\sqrt{2} + 3\sqrt{3}$$

$$\frac{2\sqrt{2} + 3\sqrt{3}}{2 - \sqrt{9}} \times \frac{2 + \sqrt{9}}{2 + \sqrt{9}} = \frac{10\sqrt{2} + 2\sqrt{12} + 18\sqrt{3} + 3\sqrt{18}}{19}$$

$$= \frac{19\sqrt{3} + 19\sqrt{2}}{19} = \sqrt{3} + \sqrt{2}$$

$$2(\sqrt{9} - 1)^{-1} = \frac{2}{\sqrt{3} - 1} \times \frac{\sqrt{3} + 1}{\sqrt{3} + 1} = \frac{2(\sqrt{3} + 1)}{2} = \sqrt{3} + 1$$

$$\sqrt{3} + \sqrt{2} - \sqrt{3} - 1 = \sqrt{2} - 1$$

(۱۲۷) جمله آخری اول

$$2^2 = 4 \text{ جمله آخری دوم}$$

$$3^2 = 9 \text{ جمله آخری سوم}$$

$$9^2 = 81 \text{ جمله آخری نهم}$$

$$11^2 = 121 \text{ جمله آخری هفتم}$$

مجموعه: $\{11, \dots, 75\}$

$$\frac{75 + 11}{2} = \frac{124}{2} = \sqrt{31}$$

$$f(0) = 5 \rightarrow c = 5 \quad (131)$$

$$f(-2) = 5 \rightarrow 4a - 2b + 5 = 5 \rightarrow 4a - 2b = 0 \rightarrow 2a = b$$

$$f(1) = 11 \rightarrow a + b + 5 = 11 \rightarrow a + b = 6 \xrightarrow{b=2a} 3a = 6 \rightarrow a = 2$$

$$b = 4 \quad f(n) = 2n^2 + 4n + 5 \quad \text{باید صرفاً می‌سند}$$

$$y = \sqrt{x} \xrightarrow{\text{واحد ۱۲}} y = \sqrt{x-12} \xrightarrow{\text{۲ واحد ۱۲}} y = \sqrt{x-12} + 2 \quad (132)$$

$$\text{قطع: } \sqrt{x} = \sqrt{x-12} + 2 \xrightarrow{\text{ترانز}} x = x - 12 + 4 + 4\sqrt{x-12}$$

$$4 = 4\sqrt{x-12} \rightarrow \sqrt{x-12} = 1 \rightarrow x - 12 = 1 \rightarrow x = 13$$

$$\left. \begin{array}{l} 13 \\ 4 \end{array} \right| \text{محل برخورد}$$

حساب:

$$AO = \sqrt{204 + 17} = \sqrt{221}$$

$$= \sqrt{14 \times 17} = 4\sqrt{17}$$

$$|2n^2 - 4| = 2n \quad 2n > 0$$

$$\left\{ \begin{array}{l} 2n^2 - 4 = 2n \rightarrow 2n^2 - 2n - 4 = 0 \\ 2n^2 - 4 = -2n \rightarrow 2n^2 + 2n - 4 = 0 \end{array} \right.$$

$$\left\{ \begin{array}{l} n = -1 \\ n = 2 \checkmark \\ n = 1 \checkmark \\ n = -2 \end{array} \right.$$

$$(1, 2) \rightarrow 2 - 1 = 1$$

$$g(x) = -(x+2)^2 + 4 \quad f(n) = 2n - [2n] \quad g(f(n)) = -\left(2n - [2n] - 2\right)^2 + 4 \quad (133)$$

$$0 < 2n - [2n] < 1 \xrightarrow{-2} -2 < 2n - [2n] - 2 < -1 \xrightarrow{\text{ترانز}} 1 < (2n - [2n] - 2)^2 < 4$$

$$\text{قرینه} \quad -4 < -(2n - [2n] - 2)^2 < -1 \xrightarrow{+4} 0 < g \circ f(n) < 3$$

$$p(m) \left| \frac{n^r - 1}{M(n)} \right. \quad p(n) = (n^r - 1) M(n) \quad (128)$$

$$p(n-1) = (n^r - r_n) M(n-1)$$

$$p(1-n) = (n^r - r_n) M(1-n)$$

$$Q(n) = (n^r - r_n) (M(n-1) + M(1-n)) \quad \left| \begin{array}{l} n-r=0 \rightarrow n=r \\ \hline \end{array} \right.$$

$Q(r) = 0 \rightsquigarrow$ بماند الته روی سوال خط ۱

$$\alpha + \beta = \frac{1}{\alpha \cdot \beta} \rightarrow \frac{1 - r_m}{r} = \frac{1}{\frac{r-m}{r}} \rightarrow 9 = (1 - r_m)(r - m) \quad (129)$$

$$r m^2 - \Delta m + r = 9 \rightarrow r m^2 - \Delta m - 7 = 0 \rightarrow \begin{cases} a+c=b \\ m = -1 \\ m = \frac{7}{r} \end{cases}$$

$$m = -1: \quad r n^2 - r n + r = 0 \quad \Delta < 0 \quad \varepsilon$$

$$m = \frac{7}{r}: \quad r n^2 + 7n - \frac{r}{r} = 0 \quad \Delta > 0 \quad \checkmark$$

$$\cup \quad \alpha = 1: \quad 1 < \frac{r}{1} < 3 \quad \checkmark \quad \text{ب ۳ حذف} \quad (130)$$

$$\alpha = 1, 0: \quad 1 < \frac{r_{10}}{r} < 3 \quad \checkmark \quad \text{ب ۱ و ۰ حذف}$$

$$\underline{r}$$

$$\begin{array}{l} 2 + \sqrt{n} = 4 \rightarrow n = 4 \\ n + \sqrt{n} = 12 \rightarrow n = 9 \end{array} \rightarrow 4 + 9 = 13 \quad \text{جواب}$$

۱۳۶
 به بر سر نزنید
 نزنید اگر f نزنید زهرم دارد
 قطعاً عمل بر خورد (۱- و ۱) خواهد بود
 پس باید (۱ و ۱-) در تابع f صدق کند

$$f(n) = n - \frac{2}{n}$$

$$f(-1) = -1 - \frac{2}{-1} = 1 \quad \checkmark$$

جواب

$$b_{r^2} = \frac{1}{r} \rightarrow \frac{1}{r} b_{r^2} = \frac{1}{r} \rightarrow b_{r^2} = \frac{1}{r} \quad (137)$$

$$b_{r^4} = A \rightarrow b_{r^2} = \frac{1}{A} \rightarrow b_{r^2} + b_{r^2} = 1 + b_{r^2} = 1 + \frac{1}{A} = 1 + \frac{8}{18} = \frac{14}{9}$$

$$b_{r^4} = b_{r^2} + b_{r^2} = 1 + \frac{1}{A} = \frac{14}{9}$$

$$A = \frac{18}{14}$$

$$\frac{14}{9}$$

$$f(0) = -r \rightarrow -r + r^b = -r \rightarrow r^b = r \rightarrow b = 1 \quad (138)$$

$$f(n) = -r + r^{an+1} \rightarrow f\left(-\frac{1}{r}\right) = 0 \rightarrow -r + r^{-\frac{1}{r}a+1} = 0$$

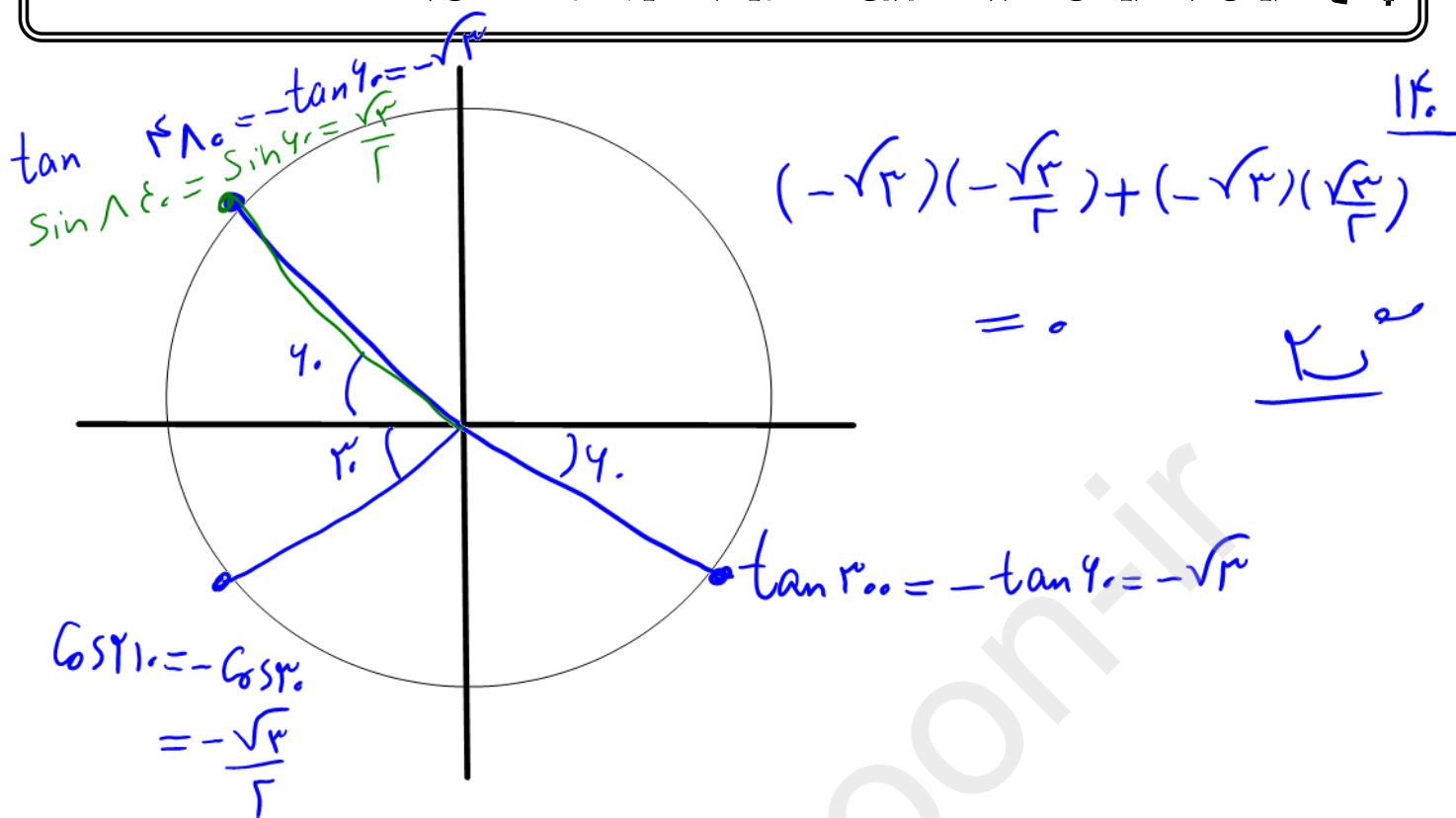
$$r^{-\frac{1}{r}a+1} = r \rightarrow -\frac{1}{r}a+1 = 1 \rightarrow a = -r$$

$$f(n) = -r + r^{-rn+1} \rightarrow f\left(-\frac{2}{r}\right) = -r + r^4 = 7 \rightarrow r^4 = 7+r$$

$$f(n) = \frac{r^n}{r} + \frac{1}{rn} = r \rightarrow t + \frac{1}{t} = r \quad (139)$$

$$\rightarrow t^2 - rt + 1 = 0 \quad \Delta = r^2 - 4 \rightarrow \begin{cases} t = \frac{r + \sqrt{r^2 - 4}}{2} = r + \sqrt{r} \\ t = r - \sqrt{r} \end{cases}$$

$$\begin{cases} r^n = r + \sqrt{r} \rightarrow n = \log_r(r + \sqrt{r}) \checkmark \\ r^n = r - \sqrt{r} \rightarrow n = \log_r(r - \sqrt{r}) \rightarrow \text{غالب} \rightarrow \underline{\underline{\text{دائم}}}$$



$$y = a \cos n + c$$

فرمته من له (a)

۱۴۱

$$\text{Max} = r = a + c$$

فرمته سینوس: $a < 0$

$$f\left(\frac{\sqrt{\pi}}{r}\right) = 0 \rightarrow a \cos \frac{\sqrt{\pi}}{r} + c = 0 \rightarrow \frac{a}{r} + c = 0 \rightarrow a + rc = 0$$

$$\begin{cases} -a + c = r \\ a + rc = 0 \end{cases}$$

$$rc = r \rightarrow c = 1$$

$$a + r = - \rightarrow a = -2$$

$$|a| = \frac{\text{Max} - \text{min}}{r} = \frac{r}{r} = 1 \rightarrow a = -1$$

$a < 0$ ۱۴۲

$$T = \frac{9\pi}{r} - \left(-\frac{3\pi}{r}\right) = 4\pi = \frac{2\pi}{|b|} \rightarrow b = \frac{1}{r} \quad \frac{a}{b} = \frac{-1}{\frac{1}{r}} = -r$$

$$\sin\left(2n - \frac{\pi}{2}\right) = \sin\left(\frac{\pi}{2} - \left(n + \frac{\pi}{2}\right)\right) = \sin\left(\frac{\pi}{2} - n\right) \quad 143$$

$$\left\{ \begin{aligned} 2n - \frac{\pi}{2} &= 2k\pi + \frac{\pi}{2} - n \rightarrow 3n = 2k\pi + \frac{\pi}{2} \rightarrow n = \frac{2k\pi}{3} + \frac{\pi}{6} \\ 2n - \frac{\pi}{2} &= 2k\pi + \pi - \frac{\pi}{2} + n \rightarrow n = 2k\pi + \pi \end{aligned} \right.$$



$$[n] = -3 \quad \frac{\text{صفر منطوق}}{0^-} = \text{صفر منطوق} \quad 144$$

$$\lim_{n \rightarrow \infty} \frac{a_n}{r^n} = \frac{1}{4} \rightarrow \frac{a}{r} = \frac{1}{4} \rightarrow a = \frac{r}{4} \quad 145$$

$$\lim_{n \rightarrow \infty} \frac{\frac{r}{n} - \sqrt{n^2 - 1}}{r^{n-1}} = \frac{0}{0} \xrightarrow{\text{hop}} \lim_{n \rightarrow \infty} \frac{\frac{r}{n} - \frac{r}{\sqrt{(n^2 - 1)^2}}}{r} = \frac{\frac{r}{n} - \frac{r}{n}}{r} = \frac{\frac{r}{n} - \frac{r}{n}}{r} = \frac{0}{r} = 0$$

$$\begin{cases} f(-r) = \sqrt{a+r} = r = f(-r)^- \\ f(-r)^+ = -r - rb + c \end{cases} \rightarrow -rb + c = a \quad 146$$

$$f'(n) = \begin{cases} \frac{-r}{r\sqrt{a-n}} \\ -n + b \end{cases} \quad \begin{aligned} n < -r \rightarrow f'_{-}(-r) &= \frac{-r}{r} = -\frac{1}{r} \\ n > -r \rightarrow f'_{+}(-r) &= b + r \end{aligned}$$

$b + r = -\frac{1}{r}$
 $b = -\frac{r}{r}$
 $e = \frac{1}{r}$

$$f'(n) = \psi \left(\frac{\sqrt{n^2 + 2n}}{n^2 - n} \right)^r \left(\frac{r(n+1) - (r-1)\sqrt{n^2 + 2n}}{r\sqrt{(n^2 + 2n)^r}} \right) (n^2 - n)^r \quad ۱۴۷$$

$$f'(r) = \psi \left(\frac{r}{r} \right)^r \left(\frac{(n^2 - n)^r}{\frac{r}{r}(r) - (r)(r)} \right)^r$$

$$= \psi \left(\frac{1-r}{r} \right) = \frac{-1\psi}{r} \quad ۱۴۸$$

مانند: $r(n-n^r) \geq 0$ $\left| \begin{array}{c} 0 \\ -r+r \end{array} \right|$ $0 < n \leq r$ ۱۴۸

$$f'(n) = 1 + \frac{r-2n}{r\sqrt{r(n-n^r)}} = \frac{r\sqrt{r(n-n^r)} + r - 2n}{r\sqrt{r(n-n^r)}} \rightarrow \sqrt{r(n-n^r)} = n - r$$

$$\rightarrow r(n-n^r) = n^2 - 2n + r \rightarrow 0 = 2n^2 - 2n + r \rightarrow n^2 - n + \frac{r}{2} = 0$$

$$\Delta = 1 \quad \left\{ \begin{array}{l} n = \frac{1 + \sqrt{1-r}}{2} = \frac{1 + \sqrt{r}}{2} \\ n = \frac{1 - \sqrt{1-r}}{2} = \frac{1 - \sqrt{r}}{2} \end{array} \right.$$

n	0	$\frac{1-\sqrt{r}}{2}$	$\frac{1+\sqrt{r}}{2}$	r
f'	///	-	+	-
f	///	↘	↗	///

Man

$$\text{Man} \left| \begin{array}{l} r+\sqrt{r} \\ r+2\sqrt{r} \end{array} \right. \rightarrow y-n=0 \text{ : موازی}$$

$$\frac{|r+2\sqrt{r} - r - \sqrt{r}|}{\sqrt{1^2 + (-1)^2}} = \frac{\sqrt{r}}{\sqrt{2}} = 1 \quad ۱۴۹$$



$$r^2 + y^2 = 100 \rightarrow y^2 = 100 - r^2 \rightarrow y = \sqrt{100 - r^2} \quad 149$$

$$V = \frac{1}{3} \pi r^2 h = \frac{1}{3} \pi (y^2) (r) = \frac{1}{3} \pi (100 - r^2) (r)$$

$$= \frac{1}{3} \pi (100r - r^3)$$

مشتق $100 - 3r^2 = 0$

$$r^2 = \frac{100}{3} \rightarrow r = \frac{10}{\sqrt{3}}$$

$$y = \sqrt{100 - \frac{100}{3}} = \sqrt{\frac{200}{3}} = \frac{10\sqrt{2}}{\sqrt{3}}$$

$$\frac{\frac{10\sqrt{2}}{\sqrt{3}}}{\frac{10}{\sqrt{3}}} = \sqrt{2} \quad 3 \text{ ج}$$

$$\text{صورتی} \quad \binom{9}{5} = \binom{9}{4} = \frac{9 \times 8 \times 7 \times 6}{4 \times 3 \times 2 \times 1} = 9 \times 2 \times 7 = 18 \times 7 = 126 \quad (150)$$

$$\text{صورتی} \quad \binom{7}{3} = 35$$

هر دو صورتی با هم

$$126 - 35 = 91 \quad 3 \text{ ج}$$

$$n(S) = 1!$$

$$n(A) = 3! \times 2! \times 2!$$

$$\text{احتمال} = \frac{3! \times 2! \times 2!}{1 \times 7 \times 4 \times 2!} = \frac{1}{28} \quad 151$$

3 ج

$$\bar{x} = \frac{2(10) + 4(11) + 7(14)}{14} = \frac{20 + 44 + 98}{14} = \frac{162}{14} = 12 \quad (12r)$$

$$\sigma^2 = \frac{2(10-12)^2 + 4(11-12)^2 + 7(14-12)^2}{14} = \frac{20 + 4 + 28}{14} = \frac{52}{14}$$

$$\sigma^2 = \frac{52}{14} = \frac{13}{4} \rightarrow \sigma = \frac{\sqrt{13}}{2} \rightarrow CV = \frac{\sigma}{\bar{x}} = \frac{\frac{\sqrt{13}}{2}}{12}$$

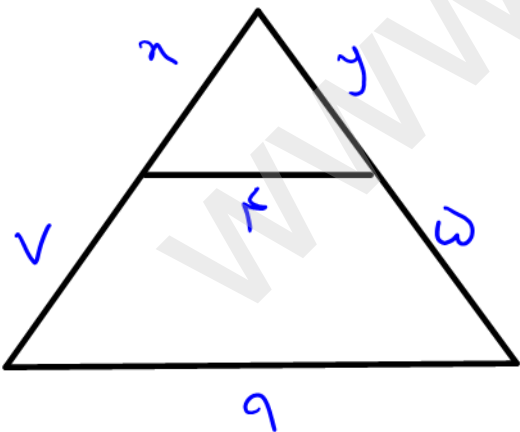
$$CV = \frac{\sqrt{13}}{24} = 0,15 \quad 25^e$$

12r ضلع BC : شب : $\frac{\delta}{\omega} = 1$ ←

$$y - r = 1(n - v)$$

$$y = n - r \rightarrow y - n + r = 0$$

$$\frac{|\delta - 1 + r|}{\sqrt{1 + (-1)^2}} = \frac{1}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{1\sqrt{2}}{2} = \frac{\sqrt{2}}{2} = \frac{\sqrt{2}}{2} \quad BC, A \text{ و } B \quad 25^e$$



$$\frac{n}{v+n} = \frac{r}{q} \quad (25r)$$

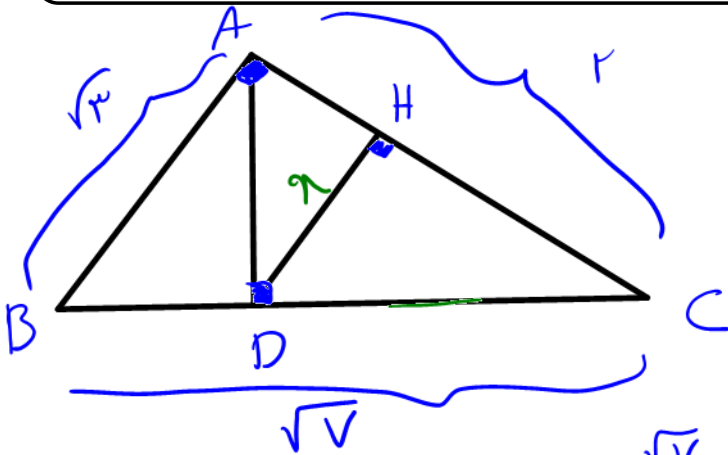
$$qn = rn + 2n$$

$$\delta n = 2n \rightarrow n = \frac{2n}{\delta} = \delta, 4$$

$$\frac{y}{y+\delta} = \frac{r}{q} \rightarrow qy = ry + r$$

$$\delta y = r \rightarrow y = \frac{r}{\delta} = \frac{2}{2} = 1$$

خط : $n + y + r = \delta, 4 + 1 + 1 = 13, 7$ 25^e



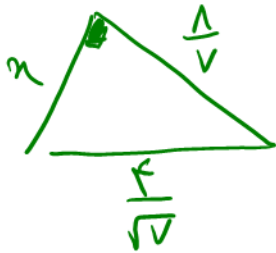
$$AD \times \sqrt{v} = r \times \sqrt{r} \quad \text{مسئله ۱۵۵}$$

$$AD = \frac{r\sqrt{r}}{\sqrt{v}}$$

$$AB^2 = BD \times BC \rightarrow r^2 = BD \times \frac{\sqrt{v}}{v} \rightarrow BD = \frac{r}{\sqrt{v}} \quad \Rightarrow \quad \text{مسئله ۱۵۵}$$

$$DC = \sqrt{v} - \frac{r}{\sqrt{v}} = \frac{v-r}{\sqrt{v}}$$

$$DC^2 = CH \times AC \rightarrow \frac{(v-r)^2}{v} = r \times CH \rightarrow CH = \frac{(v-r)^2}{rv}$$



$$r^2 + \frac{(v-r)^2}{v} = \frac{r^2}{v} \rightarrow r^2 = \frac{11r^2 - 4rv}{4v} = \frac{4r}{4v} \rightarrow r = \frac{4\sqrt{r}}{v}$$

$$\text{مسئله ۱۵۵} \quad \text{DHC: } \frac{\frac{r\sqrt{r}}{\sqrt{v}} \times \frac{1}{v}}{r} = \frac{17\sqrt{r}}{4v}$$

$$\text{نسبت دو مثلث} \quad \frac{\frac{r\sqrt{r}}{\sqrt{v}}}{\frac{17\sqrt{r}}{4v}} = \frac{4}{17}$$

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