

دانش سرگرم کنکور اساتید تجربی ۹۹ - نظام جدید - سید محمد نورالدین - A

بینا خدا

$$\frac{2\sqrt{2}+2\sqrt{2}}{5-\sqrt{6}} - \frac{2}{\sqrt{3}-1} = \frac{2\sqrt{2}+2\sqrt{2}}{5-\sqrt{6}} \times \frac{5+\sqrt{6}}{5+\sqrt{6}} - \frac{2(\sqrt{3}+1)}{2}$$

$$= \frac{19(\sqrt{2}+\sqrt{2})}{19} - \sqrt{3}-1 = \sqrt{2}-1 \rightarrow \text{ج} =$$

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در سهم:

$$a = 9^2 = 81$$

$$b = 81 + 1 = 82$$

$$c = \frac{81 + 82}{2} = 81.5 \rightarrow \text{ج} =$$

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* $p(x) = (x-1)(x+1)m(x) \rightarrow \begin{cases} p(1) = 0 \\ p(-1) = 0 \end{cases}$

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* $Q(1) = p(1) + p(-1) = 0 + 0 = 0 \rightarrow \text{ج} =$

* $\alpha + \beta = \frac{1}{\alpha\beta} \Rightarrow \frac{-(r-m-1)}{r} = \frac{r}{r-m} \Rightarrow (m-2)(r-m-1) - 9 = 0$

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$\rightarrow 2m^2 - 2m - 7 = 0$

$$\xrightarrow{a+c=b} \begin{cases} m = -1 \rightarrow \Delta < 0 \rightarrow \text{عقده} \\ m = \frac{1}{2} \checkmark \rightarrow \text{ج} = \end{cases}$$

* $1 < \frac{x+1}{x-1} < 2$

$$\begin{cases} x-1 = x+1 \rightarrow x = 2 \\ x-2 = x+1 \rightarrow x = \frac{3}{2} = 1.5 \end{cases} \Rightarrow x \in (1.5, 2) \rightarrow \text{ج} =$$

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در سهم: $\frac{1}{x} = 2$

$$\xrightarrow{(-2)} -1 < \frac{x+1}{x-1} - 2 < 1 \rightarrow \left| \frac{-x+3}{x-1} \right| < 1 \rightarrow \dots$$

* $f(1) = 2 \rightarrow c = 2 \rightarrow f(x) = ax^2 + bx + 2$

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$\begin{cases} (2, 5) \\ (1, 2) \end{cases} \xrightarrow{\text{مشتق از } f} x_2 = \frac{-2+5}{2} = -1 = \frac{-b}{2a} \Rightarrow b = 2a \Rightarrow f(x) = ax^2 + 2ax + 2$

$(1, 1) \rightarrow 1 = 2a \rightarrow a = \frac{1}{2} \rightarrow f(x) = \frac{1}{2}x^2 + x + 2 \rightarrow f(-1) = 3 \rightarrow \text{جواب}$

$\sqrt{x} \xrightarrow{\text{مشتق از } \sqrt{x}} \sqrt{x-1} \xrightarrow{\text{مشتق از } \sqrt{x-1}} \sqrt{x-1} + 1 = g(x)$

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* $f(x) = g(x) \rightarrow \sqrt{x} = \sqrt{x-1} + 1 \Rightarrow \epsilon \sqrt{x} \rightarrow x = 14 \text{ (تقریبی)} \Rightarrow A(14, 4)$

$\Rightarrow \theta A = \sqrt{14^2 + 4^2} = \epsilon \sqrt{14} \rightarrow \text{جواب}$

$|2x^2 - \epsilon| < 2x \rightarrow |x^2 - 1| < x \xrightarrow{\text{فاصله بین دو عدد}} \text{فاصله بین دو عدد}$

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$\rightarrow -x < x^2 - 2 < x \rightarrow \begin{cases} x^2 + x - 2 > 0 \rightarrow (x+2)(x-1) > 0 \xrightarrow{x>0} \boxed{x > 1} \text{ ①} \\ x^2 - x - 2 < 0 \rightarrow (x-2)(x+1) < 0 \xrightarrow{x>0} \boxed{0 < x < 2} \text{ ②} \end{cases}$

$\text{①} \cap \text{②} \rightarrow x \in (1, 2) \rightarrow \max(b-a) = 2-1 = 1 \rightarrow \text{جواب}$

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* $f(x) = 2x - [2x] \rightarrow D_f = D_g = \mathbb{R}, 0 \leq 2x - [2x] < 1 \rightarrow g \circ f = g(f(x))$

* $g(x) = -x^2 + \epsilon x$

در این بازه فاصله بین دو عدد

$\Rightarrow g(x) = -x^2 + \epsilon x, 0 \leq x < 1 \rightarrow \text{در این بازه فاصله بین دو عدد}$

$\Rightarrow \text{جواب} = [g(0), g(1)] = [0, \epsilon] \rightarrow \text{جواب}$

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* $(4, a) \in f^{-1} \rightarrow (a, 4) \in f \rightarrow a + \sqrt{a} = 4 \rightarrow a = 4$

* $(12, b) \in f^{-1} \rightarrow (b, 12) \in f \rightarrow b + \sqrt{b} = 12 \rightarrow b = 9 \rightarrow a+b = 13 \rightarrow \text{جواب}$

پس: $f^{-1}(x) = \left(\sqrt{x + \frac{1}{\epsilon}} - \frac{1}{\epsilon}\right)^2 \rightarrow \dots$

$f(x) = x - \frac{x}{n}, n < 0 \rightarrow f'(x) = 1 + \frac{x}{n^2} > 0 \rightarrow \text{در این بازه فاصله بین دو عدد}$

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پس: به نفع علاقه مندان به ریاضیات

$f(x) = x \Rightarrow x - \frac{x}{n} = -x \Rightarrow x^2 = 1 \rightarrow x = \pm 1 \xrightarrow{x>0} \boxed{x=1} \rightarrow \text{جواب}$

بالعشر من شهر ربيع الأول ١٤٩٩ - سيد محمد بن عبد الله

$$* \log_4 12 = \frac{\log_2 12}{\log_2 4} = \frac{1 + \log_2 6}{2} = \frac{1 + 1.2}{2} = \frac{2.2}{2} = 1.1 \rightarrow \text{ج}$$

$$* \log_2 12 = 1.1 \rightarrow \log_2 6 = 1.2$$

$$+ f(1) = -2 \rightarrow -2 + 2^b = -2 \rightarrow b = 1$$

$$* f(-\frac{1}{2}) = 0 \rightarrow -2 + 2^{-\frac{a}{2} + 1} = 0 \rightarrow 2^{-\frac{a}{2} + 1} = 2 \rightarrow 1 - \frac{a}{2} = 2 \rightarrow a = -2$$

$$\rightarrow f(x) = -2 + 2^{-2x+1} \rightarrow f(-\frac{a}{2}) = -2 + 2^{2+1} = 6 \rightarrow \text{ج}$$

$$f^{-1}(x) = a \rightarrow f(a) = x \rightarrow \frac{1}{x} (x^a + \frac{1}{x^a}) = x$$

$$\rightarrow (x^a)^2 - x(x^a) + 1 = 0 \xrightarrow{\Delta \rightarrow \dots} x^a = \frac{x \pm \sqrt{x^2 - 4}}{2} = x \pm \sqrt{x}$$

$$\log_2 \rightarrow a = \log_2 (x \pm \sqrt{x})$$

جواب سؤال f بمورد $x = 0$ است باز است $a \in D_f$ $\leftarrow$ $a = \log_2 (1 + \sqrt{1})$

$$\tan(40^\circ - 30^\circ) \cos(110^\circ + 30^\circ) + \tan(40^\circ - 30^\circ) \sin(140^\circ - 70^\circ)$$

$$= \tan(-10^\circ) (-\cos 80^\circ) + \tan(-10^\circ) \sin 70^\circ = \tan 10^\circ \cos 80^\circ - \tan 10^\circ \sin 70^\circ = 0$$

$$y = a + b \cos x \rightarrow y_{\max} = 3 \Rightarrow a - b = 3 \quad (1)$$

$$* y(\frac{\pi}{2}) = 0 \rightarrow a + b \cos(\frac{\pi}{2}) = 0 \rightarrow b = -2a \quad (2)$$

$$\xrightarrow{(1), (2)} a = 1, b = -2 \rightarrow \text{ج}$$

$$\text{در } x = 0 \text{ مقدار } \rightarrow ab < 0$$

$$* T = \frac{2\pi}{\omega} - (-\frac{2\pi}{\omega}) = 4\pi = \frac{2\pi}{|b|} \Rightarrow |b| = \frac{1}{2} \rightarrow \begin{cases} a = 2 \\ b = -\frac{1}{2} \end{cases} \text{ و } \begin{cases} a = -2 \\ b = \frac{1}{2} \end{cases}$$

$$* |a| = \frac{1 - (-2)}{2} = 1.5 \rightarrow \frac{a}{b} = -2 \rightarrow \text{ج}$$

$$\cos(x + \frac{\pi}{2}) = \sin(x - \frac{\pi}{2}) = \cos(x - \frac{\pi}{2} - \frac{\pi}{2}) = \cos(x - \frac{\pi}{2}) \quad - [143]$$

$$\Rightarrow x - \frac{\pi}{2} = 2k\pi \pm (x + \frac{\pi}{2}) \rightarrow \begin{cases} x = 2k\pi + \pi \quad (\text{مطلوبہ}) \\ x = \frac{2k\pi}{2} + \frac{\pi}{2} \rightarrow \text{ج} = \end{cases}$$

$$\lim_{x \rightarrow (-r)^-} \frac{[x] + r}{x + r} = \frac{[(-r)^-] + r}{(-r)^- + r} = \frac{0}{0^-} = 0 \rightarrow \text{ج} = \quad - [144]$$

$$\lim_{x \rightarrow \infty} \frac{a_n - \sqrt[n]{n^{r-1}}}{\epsilon n^r - 12} = \frac{1}{r} \quad n=1 \rightarrow \frac{a}{\epsilon} = \frac{1}{r} \rightarrow a = \frac{r}{r}$$

$$\lim_{x \rightarrow r} \frac{\frac{r}{r}x - \sqrt[n]{n^{r-1}}}{\epsilon n - 12} = \frac{0}{0} \xrightarrow{\text{HOP}} \lim_{x \rightarrow r} \frac{\frac{r}{r} - \frac{r}{r\sqrt[n]{n^{r-1}}}}{\epsilon} = \frac{1}{r\epsilon} \rightarrow \text{ج} =$$

$$\begin{aligned} \text{مشتق} = r = f(r) \\ x = -r: \text{مشتق} = -r - rb + c \Rightarrow \boxed{c - rb = a} \quad (1) \end{aligned} \quad - [145]$$

$$\text{مشتق} = \text{مشتق} \Rightarrow f'(x) = \frac{-1}{r}, f'(-r) = +r + b \rightarrow b = -\frac{r}{r}$$

$$\rightarrow (1) \rightarrow c = \frac{1}{r} \rightarrow \text{ج} =$$

$$f(x) = \frac{x^2 + rx}{(x^2 - x)^r} \rightarrow f'(x) = \frac{(x^2 + r)(x^2 - x) - r(x^2 - 1)(x^2 + rx)}{(x^2 - x)^{\epsilon}} \quad - [146]$$

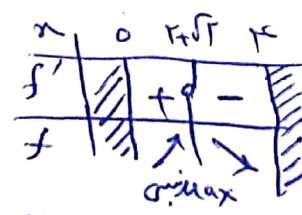
$$\rightarrow f'(r) = \frac{4(r) - r(r)(1)}{1 \times r} = -\frac{12}{\epsilon} \rightarrow \text{ج} =$$

$$f(x) = x + \sqrt{\epsilon x - x^2} \quad \text{در } [0, \epsilon] \rightarrow f'(x) = 1 + \frac{r-x}{\sqrt{\epsilon x - x^2}} = 0 \quad - [147]$$

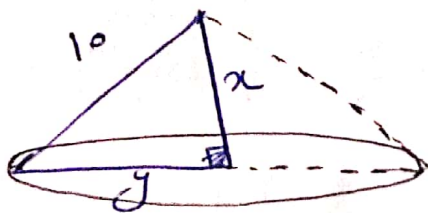
$$\rightarrow \sqrt{\epsilon x - x^2} = x - r \quad \text{فرض } x > r \rightarrow x = r \pm \sqrt{r} \rightarrow x = r + \sqrt{r}$$

$$\rightarrow f(x) = x + \sqrt{\epsilon - (x-r)^2} \rightarrow f(r + \sqrt{r}) = r + \sqrt{r} + \sqrt{r} = r + 2\sqrt{r}$$

$$\rightarrow A(r + \sqrt{r}, r + 2\sqrt{r}), x - y = 0 \rightarrow d = \frac{1 - \sqrt{r}}{\sqrt{r}} = 1 \rightarrow \text{ج} =$$



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$$V = \frac{1}{3} (\pi y^2) x, \quad x^2 + y^2 = 100$$

$$\Rightarrow V(x) = \frac{\pi x}{3} (100 - x^2) \rightarrow V'(x) = 0$$

$$\rightarrow x^2 = \frac{100}{3} \rightarrow y^2 = 100 - \frac{100}{3} = \frac{200}{3}$$

$$\rightarrow \frac{y^2}{x^2} = \frac{200}{100} \rightarrow \frac{y}{x} = \frac{\sqrt{2}}{1} \rightarrow \text{ج}$$

روش اول: $\binom{9}{5} - \binom{2}{2} \times \binom{7}{3} = \frac{9 \times 8 \times 7 \times 6}{4 \times 3 \times 2 \times 1} - \frac{2 \times 2 \times 2}{1 \times 2 \times 1} = 7(11-2) = 91$

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روش دوم: $\binom{2}{1} \times \binom{7}{4} + \binom{7}{5} = 91 \rightarrow \text{ج}$
 فقط دو آٹھ و دو سولہ
 ہیکڑام آٹھ و دو سولہ
 درجہ بی شریک کنند

$(F_1 F_2 F_3 F_4) (E_1 E_2 E_3) \Rightarrow P = \frac{2! \times 4! \times 2!}{8!} = \frac{1}{24} \rightarrow \text{ج}$

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$\bar{x} = 12, \quad \sigma^2 = \frac{\sum (x_i - \bar{x})^2}{12} = \frac{12(2) + 2(1)}{12} \Rightarrow \sigma = \frac{\sqrt{12}}{2}$

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$CV = \frac{\sigma}{\bar{x}} = \frac{\sqrt{12}}{24} \approx 0.12 \rightarrow \text{ج}$

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$\Rightarrow S = \frac{1}{2} |(4+32-2) - (10+3-12)| = 20$
 $S = \frac{AH \times BC}{2} \Rightarrow AH = \frac{2S}{BC} = \frac{20}{2\sqrt{2}} = \frac{10}{\sqrt{2}} = 5\sqrt{2} \rightarrow \text{ج}$
 $* BC = \sqrt{2^2 + 2^2} = 2\sqrt{2}$



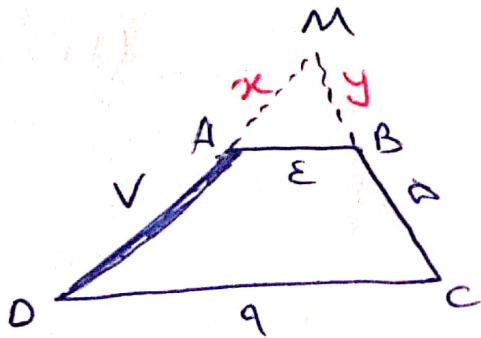
$m_{BC} = \frac{2+2}{2-2} = 1 \rightarrow \text{ج}$
 $\Rightarrow AC: y+2 = x-2 \Rightarrow x-y-4=0$

فاصلہ A از BC خط: $d = \frac{|1-2-4|}{\sqrt{1+1}} = 5\sqrt{2}$

A(1,2)

(نوال الدني)

122 - منطوره ذرقة م ΔABD :

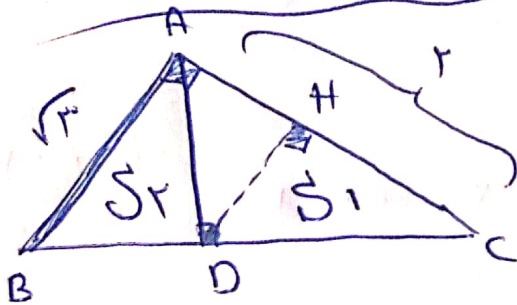


$$\frac{x}{x+v} = \frac{\varepsilon}{a} \rightarrow \frac{x}{v} = \frac{\varepsilon}{a} \Rightarrow x = \frac{va}{a}$$

$$\frac{y}{a} = \frac{\varepsilon}{a} \rightarrow y = \varepsilon$$

$$MAB \text{ محيطه } = x + y + \varepsilon = 1 + \frac{va}{a} = 1 + 0.12 = 1.12 \rightarrow \sqrt{}$$

122 -



$$BC = \sqrt{r^2 + \varepsilon^2} = \sqrt{v}$$

$$AD \times BC = AB \times AC \rightarrow AD = \frac{r\sqrt{r}}{\sqrt{v}}$$

$$AD^2 = AH \times AC \Rightarrow \frac{\varepsilon \times r}{v} = AH \times r$$

$$\rightarrow AH = \frac{v}{v} \rightarrow HC = r - \frac{r}{v} = \frac{1}{v}$$

$$\Delta ABD \sim \Delta CDH \Rightarrow \frac{s_1}{s_r} = k^2 = \left(\frac{HC}{AD}\right)^2 = \frac{14}{21} \rightarrow \sqrt{}$$

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