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درسنامه ها و جزوه های دروس ریاضیات

دانلود نمونه سوالات امتحانات ریاضی

نمونه سوالات و پاسخنامه کنکور

دانلود نرم افزارهای ریاضیات

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کانال سایت ریاضی سرا در تلگرام:

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ریاضی عمومی تجربی / فصل ۹۴

عبد قادر

۱۲۴) $f^{-1}(g(2a)) = 4 \Rightarrow g(2a) = f(4) = 3$

$g(2a) = 3 \Rightarrow \frac{2a}{2a-1} = 3 \Rightarrow 2a = 6a - 3$

$3 = 4a$

$\Rightarrow a = \frac{3}{4}$

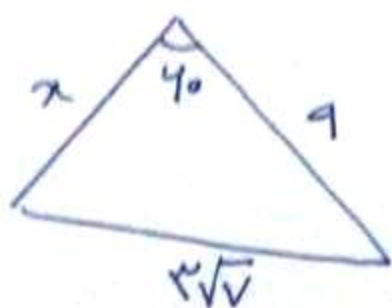
۱۲۵) $1^{x-y} \times 1^{2x+2y} = 1 \Rightarrow 1^{2x+2y-y} = 1 \Rightarrow 2x+y-y=0$

$\log y = \log 9x \Rightarrow y = 9x$

$2x + 18x = y \Rightarrow 20x = y$

$x = \frac{1}{5} \Rightarrow y = 4$

۱۲۸)



$(3\sqrt{2})^2 = x^2 + 18 - 2x(9)\cos 40^\circ$

$43 = x^2 + 18 - 18x$

$x^2 - 18x + 25 = 0 \Rightarrow (x-7)(x-4) = 0 \Rightarrow x = 7, 4$

۱۲۹) $A^{-1} = \frac{1}{2} \begin{bmatrix} 4 & -2 \\ -5 & 3 \end{bmatrix} / A^{-1}(2B) = \frac{1}{2} \begin{bmatrix} 4 & -2 \\ -5 & 3 \end{bmatrix} \times \begin{bmatrix} 4 & -4 \\ 3 & -5 \end{bmatrix}$
 $= \begin{bmatrix} 1 & -14 \\ -11 & 15 \end{bmatrix}$

۱۳۰) $\alpha = \frac{VF}{100 + VF + 2 + 18V + 4F} \times 340 = 10$

۱۳۱) معادله

مقدار	۷	۹	۱۷	۱۱	۹
فرکانس					

C.V = $\frac{\sum fX}{\sum f}$

$\bar{X} = \frac{10 + 18 + 11 + 0 + 22 + 24}{50} = \frac{65}{50} = 1.3$

$\sigma^2 = \frac{(4-1.3)^2 \times 7 + 9 \times (11-1.3)^2 + \dots}{50} = 5.14 \Rightarrow \sigma = 2.27$ C.V = $\frac{2.27}{1.3} = 1.74$

$$132) P(A) = \frac{\binom{4}{1} \binom{4}{1} \binom{3}{1}}{\binom{11}{3}} = \frac{4 \times 4 \times 3}{11!} = \frac{12}{11}$$

$$133) -1 < \frac{x+1}{x-2} < 3 \quad \left\{ \begin{array}{l} \frac{x+1}{x-2} > -1 \Rightarrow \frac{x+1}{x-2} + 1 > 0 \Rightarrow \frac{x+1+x-2}{x-2} > 0 \\ (x+1) > 0 \Rightarrow x > -1 \quad (1) \\ \frac{x+1}{x-2} < 3 \Rightarrow \frac{x+1-3x+6}{x-2} < 0 \Rightarrow \frac{-2x+7}{x-2} < 0 \Rightarrow x < \frac{7}{2} \quad (2) \end{array} \right.$$

① ∩ ② : $x < \frac{7}{2}$

$$134) \tan \frac{x}{2} - \cot \frac{x}{2} = -2 \cot x$$

$$= -2 \left(\frac{1}{\tan x} \right) = -\frac{2}{\tan x}$$

$$135) g(f(x)) = \frac{2 \left(\frac{2x-1}{x+1} \right) + 2}{2 - \left(\frac{2x-1}{x+1} \right)} = \frac{2x-1+2x+2}{2x+2-2x+1} = \frac{4x+1}{1} = 4x+1$$

$$136) \lim_{x \rightarrow 2} \left(\frac{4}{x(x-2)} - \frac{x(x+1)}{x(x-2)} \right)$$

$$= \lim_{x \rightarrow 2} \frac{-x^2 + 4 - x}{x^2 - 2x} = \lim_{x \rightarrow 2} \left(-\frac{x+2}{x} \right) = -\frac{4}{2} = -2$$

$$137) \lim_{x \rightarrow 0} f(x) = \lim_{x \rightarrow 0} \frac{x}{1 - \sqrt{1-x}} \stackrel{H}{=} \lim_{x \rightarrow 0} \frac{1}{-\frac{-1}{2\sqrt{1-x}}} = 2 \Rightarrow a=2$$

$$138) y' = -2(2) \left(-\frac{1}{2} \right) \cos \left(\frac{\pi}{4} - \frac{x}{2} \right) \sin \left(\frac{\pi}{4} - \frac{x}{2} \right)$$

$$= \frac{1}{2} \sin \left(\frac{\pi}{2} - \frac{x}{2} \right) = \frac{1}{2} \left(\frac{\sqrt{2}}{2} \right) = \frac{\sqrt{2}}{4}$$

$$139) \quad p = \frac{40}{100} \times \frac{11}{100} + \frac{40}{100} \times \frac{12}{100} = \frac{104}{1000}$$

$$140) \quad p = \binom{4}{r} \left(\frac{1}{r}\right)^r \left(\frac{r}{r}\right)^r = \frac{132}{1024}$$

$$141) \quad f^{-1}(x) = \begin{cases} x^r & x \geq 0 \\ -x^r & x < 0 \end{cases} \quad \begin{aligned} f(-1) &= -1 \\ f^{-1}(-1) &= -1 \end{aligned}$$

$$142) \quad a_n: \frac{r}{r}, \frac{13}{10}, \dots \rightarrow \frac{r}{r}$$

$$143) \quad \begin{cases} \int \ln(r_y - r_n) + \ln r = 0 \Rightarrow r_y + r_n = \frac{1}{r} \Rightarrow r_y - r_n = 1 \quad (1) \\ \int \ln(r_{n+1}) + \ln(y-r) - \ln y = \ln r \Rightarrow (r_{n+1})(y-r) = r_y \quad (2) \end{cases}$$

ریشه هر دو معادله: $\frac{r}{r}$

$$(1), (2) \Rightarrow u = \frac{a}{r}, \quad y = r \Rightarrow ay = 1.$$

$$144) \quad r \varphi^n - 1 + r \varphi^n = 0 \Rightarrow r \varphi^n - 1 = 0.$$

$$\varphi^n = \pm \frac{1}{r} \Rightarrow n = \frac{2k\pi \pm \pi}{r} \quad \text{if} \quad \varphi^n = \frac{1}{r}$$

$$\varphi^n = -\frac{1}{r} \Rightarrow n = \frac{2k\pi \pm \pi}{3}$$

$$n = k\pi \pm \frac{\pi}{r}$$

محمد سرور

$$143) \quad y' = - \frac{\frac{3}{2}\sqrt{x}}{\frac{1}{3}\sqrt[3]{y^2}} \quad \frac{x=4}{y=1} \quad y'=9$$

$$y-1 = -9(x-4) \Rightarrow y+9x = 37$$

$$144) \quad x = -\frac{b}{3a} = 1 \Rightarrow a = \frac{1}{3}$$

$$(1, -3) \rightarrow b = \frac{2}{3} \Rightarrow f(x) = \frac{1}{3}x^3 - x^2 - \frac{2}{3}x + \frac{2}{3}$$

$$f'(x) = x^2 - 2x - \frac{2}{3} \xrightarrow{y'=0} \begin{cases} x = -1 \\ x = 3 \end{cases} \Rightarrow y_{\max} = y(-1) = \frac{5}{3}$$

$$145) \quad x=0 \quad : \quad 0+b=0 \quad b=0$$

$$f(x)=0 \Rightarrow \frac{4a-1}{2}=0 \quad a=\frac{1}{4} \quad a+b=\frac{1}{4}$$

$$146) \quad (y-3)^2 = 4p(x+1) \Rightarrow (9-3)^2 = 4p(2+1)$$

$$\Rightarrow p = \frac{3}{2} \quad \text{فاصله کانون تا خط}$$

$$147) \quad 14y^2 + d(x^2 - 2x) = 7d \Rightarrow 14y^2 + d(x-1)^2 = 1$$

$$\frac{y^2}{\frac{1}{14}} + \frac{(x-1)^2}{\frac{1}{d}} = 1$$

$$\frac{y^2}{a^2} + \frac{(x-1)^2}{b^2} = 1 \quad \text{وتر کانون} = \frac{2b^2}{a} = \frac{2 \times \frac{1}{d}}{\frac{1}{14}} = \frac{28}{d}$$

$$a^2 = \frac{1}{14} \quad a = \frac{1}{\sqrt{14}} \quad b^2 = \frac{1}{d}$$

$$120) \int_0^x (x - |u - r|) du = \int_0^r (x + u - r) du + \int_r^x r du$$

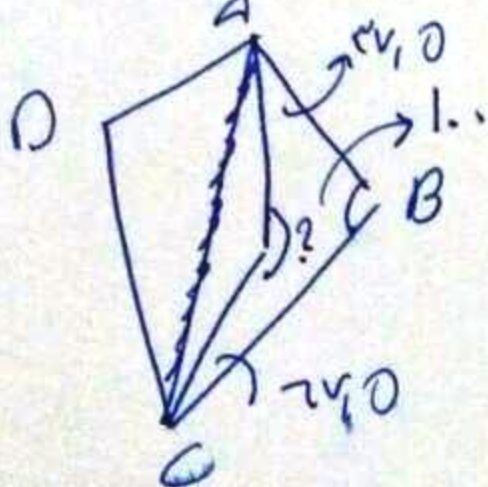
$$= \int_0^r (ru - r) du + r = \left. \frac{ru^2}{2} - ru \right|_0^r + r$$

$$121) \int \left(ru + \frac{1}{u} \right)^2 du = \int (r^2 u^2 + 2r + \frac{1}{u^2}) du = \frac{r^2}{3} u^3 + 2ru - \frac{1}{u} + C$$

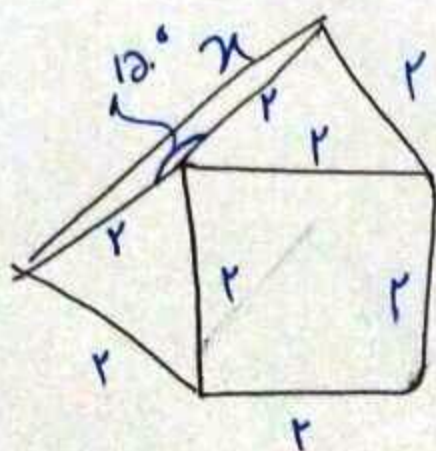
$$= \frac{ru^3 - 1 + 4ru^2}{3} + C \Rightarrow R(u) = ru^3 + 4ru^2 - 1$$

$$122) \frac{\hat{A}}{r} = \frac{\hat{B}}{r} = \frac{\hat{C}}{\omega} = \frac{d\hat{D}}{1r} = t \begin{cases} \hat{A} = rt \\ \hat{B} = rt \\ \hat{C} = \omega t \\ \hat{D} = \frac{1rt}{\omega} \end{cases}$$

$$\Rightarrow \hat{A} = v\omega \quad \hat{B} = 1.. \quad \hat{C} = 1r\omega \quad \hat{D} = \frac{1rt}{\omega}$$



$$n = 14. \Rightarrow \frac{1}{n} = \frac{1}{14}$$



$$n^2 = r^2 + r^2 - 2(r)(r)\cos\theta$$

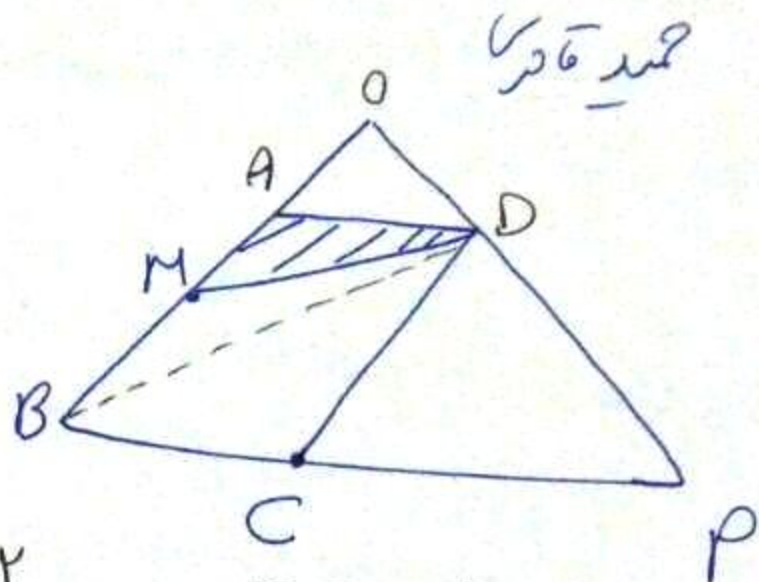
$$n^2 = 1 + \epsilon\sqrt{3}$$

$$n = \sqrt{1 + \epsilon\sqrt{3}}$$

$$= \sqrt{(\sqrt{4} + \sqrt{4})^2}$$

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

۱۰۴)



$$\frac{PC}{PB} = \frac{2}{3}, \quad \frac{BC}{PC} = \frac{1}{2}$$

$$\Rightarrow \frac{S_{ODPC}}{S_{OBP}} = \frac{4}{9}$$

از طرف ۱: $\frac{OD}{DP} = \frac{BC}{PC} = \frac{1}{2} \Rightarrow \frac{OD}{OP} = \frac{1}{3}$

$$\frac{S_{OAD}}{S_{OBP}} = \frac{1}{9} \Rightarrow \frac{S_{\text{مستطیل OAD}}}{S_{OBP}} = 1 - \left(\frac{1}{3} + \frac{4}{9} \right)$$

$$\frac{S_{\text{مستطیل الضلع}}}{S_{OBP}} = \frac{4}{9} \quad / \quad S_{AMD} = \frac{1}{2} S_{ABD} = \frac{1}{4} S_{\text{مستطیل الضلع}}$$

$$S_{AMD} = \frac{1}{4} \times \frac{4}{9} S_{OBP} \Rightarrow S_{AMD} = \frac{1}{9} S_{OBP}$$

۱۵۴) ادامه

مسئله ۱۵۴

$$\text{حجم استوانه} = \frac{1}{3} \pi R^2 h$$

$$\frac{1}{3} \pi R^2 h = \pi (4^2) \left(\frac{1}{3} \right) \Rightarrow R = 2$$

$$S = 4 \pi R^2 = 16 \pi$$