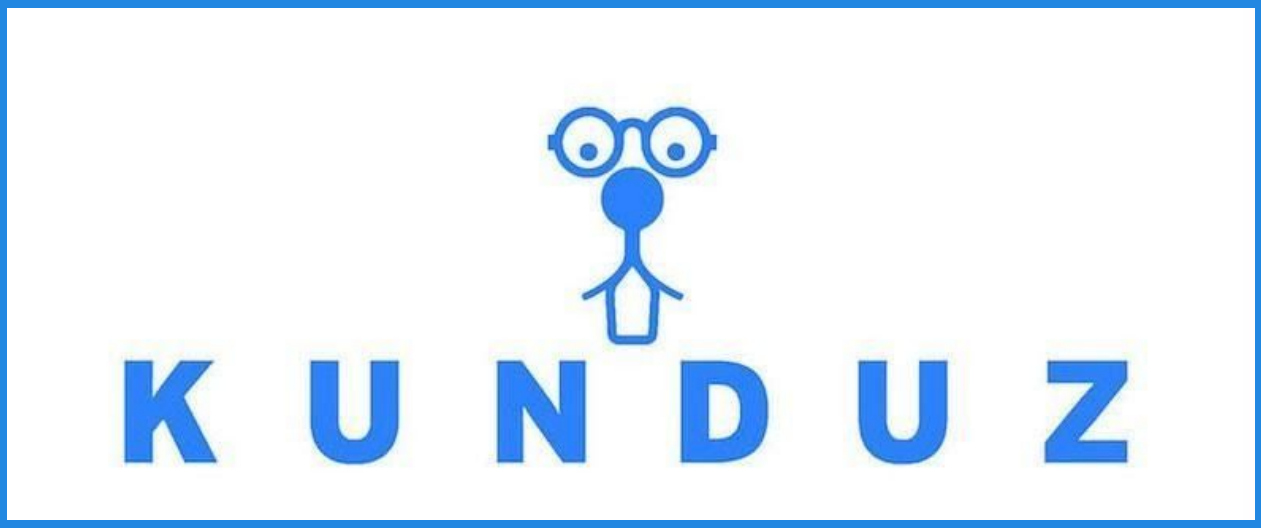

Jan 7 2020 shift 2 Mathematics prepared by KUNDUZ tutors

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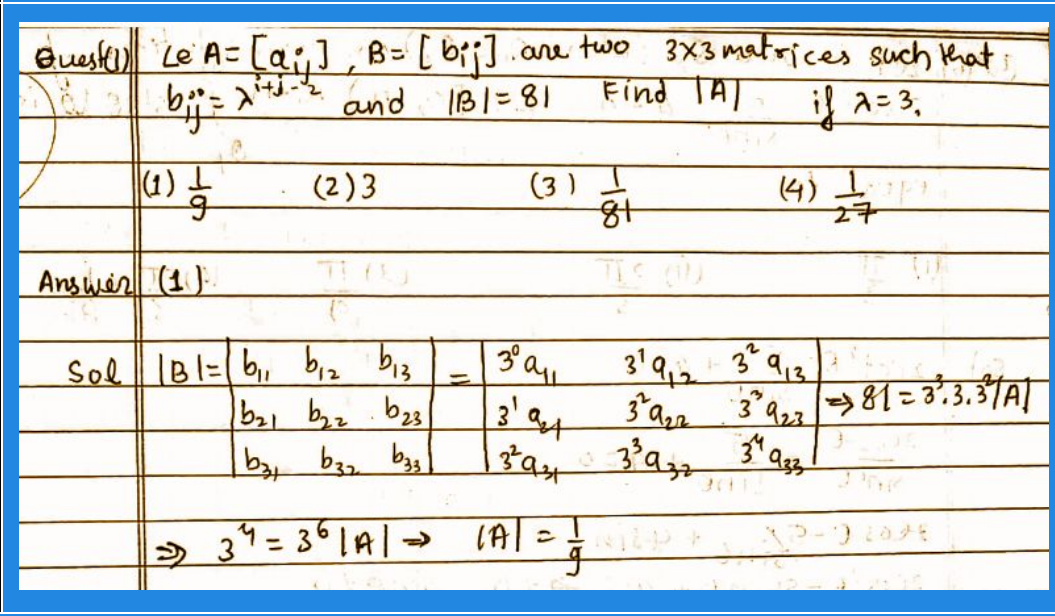
Question no.	Questions and Answers
1	

Ques(1) Le $A=[a_{ij}]$, $B=[b_{ij}]$ are two 3×3 matrices such that $b_{ij}=\lambda^{i+j-2}$ and $|B|=81$ Find $|A|$ if $\lambda=3$.

(1) $\frac{1}{9}$ (2) 3 (3) $\frac{1}{81}$ (4) $\frac{1}{27}$

Answer (1)

Sol $|B|=\begin{vmatrix} b_{11} & b_{12} & b_{13} \\ b_{21} & b_{22} & b_{23} \\ b_{31} & b_{32} & b_{33} \end{vmatrix} = \begin{vmatrix} 3^0a_{11} & 3^1a_{12} & 3^2a_{13} \\ 3^1a_{21} & 3^2a_{22} & 3^3a_{23} \\ 3^2a_{31} & 3^3a_{32} & 3^4a_{33} \end{vmatrix}$ $\Rightarrow 81=3^3.3^3|A|$

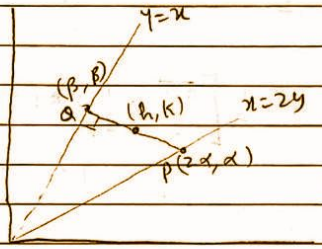
$\Rightarrow 3^4=3^6|A| \Rightarrow |A|=\frac{1}{9}$

2

Question (2) From any point P on the line $x=2y$ perpendicular is drown on $y=x$. Let Foot of perpendicular is Q. Find the locus of mid-point of PQ.

(1) $2x=3y$ (2) $5x=7y$ (3) $3x=2y$ (4) $7x=5y$

Solution-



Solpe of PQ $\Rightarrow \frac{k-\alpha}{h-2\alpha} = -1 \Rightarrow \alpha = \frac{h+k}{3}$ — (1)

Also, $2h = 2\alpha + \beta$ and $2k = \alpha + \beta$

$\Rightarrow 2h = \alpha + 2k$ & $\alpha = 2h - 2k$ — (2)

From (1) & (2)

$\frac{h+k}{3} = 2(h-k)$

So, locus is $6x - 6y = x + y \Rightarrow 5x = 7y$

Answer (2)

3

Question (3) Pair of targets are drown from origin the circle $x^2+y^2-8x-4y+16=0$ then square of length of chord of contact is

(1) $\frac{64}{5}$ (2) $\frac{24}{5}$ (3) $\frac{8}{5}$ (4) $\frac{8}{13}$

Sol $L = \sqrt{S_1} = \sqrt{16} = 4$

$R = \sqrt{16+4-16} = 2$

Length of chord of contact $= \frac{2LR}{\sqrt{L^2+R^2}} = \frac{2\times4\times2}{\sqrt{16+4}} = \frac{16}{\sqrt{20}}$

Square of length of chord of contact $= \frac{16}{5}$

So, Answer (1) 16/5

4

Question (4) contrapostive of A if $A \subset B$ and $B \subset C$ than $C \subset D$

option-(1) $C \not\subset D$ or $A \not\subset B$ or $B \not\subset C$

(2) $C \subset D$ and $A \not\subset B$ or $B \not\subset C$

(3) $C \subset D$ or $A \not\subset B$ and $\not\subset C$

(4) $C \subset D$ or $A \not\subset B$ or $B \not\subset C$

Sol- Let $P = A \subset B$, $Q = B \subset C$, $R = C \subset A$

contrapositive of $(P \wedge Q) \rightarrow R$ is $\sim R \rightarrow \sim (P \wedge Q)$

$R \vee (\sim P \vee \sim Q)$

Answer (4)

5

Question-(5) Let $y(x)$ is solution of differential equation $(y^2 - x)\frac{dy}{dx} = 1$ and $y(0) = 1$ and $y(0) = 1$ than Find the value of x where curve cuts the x-axis.

(1) $2 - e$ (2) $2 + e$ (3) 2 (4) e

Solution $\frac{dy}{dy} \cdot \frac{dx}{dy} + x = y^2$

$I.F = e^{\int 1 \, dy} = e^y$

$x \cdot e^y = \int y^2 e^y dy$

$= y^2 \cdot e^y - \int 2y \cdot e^y \cdot dy$

$\Rightarrow y^2 e^y - 2(y \cdot e^y - e^y) + c$

$x \cdot e^y = y^2 e^y - 2ye^y + 2e^y + c$

$x = y^2 - 2y + 2 + c \cdot e^{-y}$

$x = 0, \quad y = 1$

$0 = 1 - 2 + 2 + \frac{c}{e}$

$c = 1 - 2 + 2 + \frac{c}{e}$

$\Rightarrow c = -e \Rightarrow y = 0, \quad x = 0 - 0 + 2 + (-e)e^0$

$x = 2 - e$

So, Answer is (1)

6

Qu-(6) Let θ_1 and θ_2 (where $\theta_1 < \theta_2$) are two solution of $2\cot^2\theta - \frac{5}{\sin\theta} + 4 = 0$ $\theta \in [0, 2\pi)$ then $\int_{\theta_1}^{\theta_2} \cos^2 3\theta \, d\theta$ is equal to.

(1) $\frac{\pi}{3}$ (2) $\frac{2\pi}{3}$ (3) $\frac{\pi}{6}$ (4) $\frac{\pi}{3} + \frac{1}{6}$

Sol. $2\cot^2\theta - \frac{5}{\sin\theta} + 4 = 0$

$\frac{2\cos^2\theta}{\sin^2\theta} - \frac{5}{\sin\theta} + 4 = 0$

~~$2\cos^2\theta - 5/\sin\theta + 4\sin$~~

$2\cos^2\theta - 5\sin\theta + 4\sin^2\theta = 0$, $\sin\theta \neq 0$

$2\sin^2\theta - 5\sin\theta + 2 = 0$

$(2\sin\theta - 1)(\sin\theta - 2) = 0$

$\sin\theta = 1/2 \Rightarrow \theta = \frac{\pi}{6}, \frac{5\pi}{6}$

$\therefore \int_{\pi/6}^{5\pi/6} \cos^2 3\theta \, d\theta = \int_{\pi/6}^{5\pi/6} \frac{1+\cos 6\theta}{2} \, d\theta$

$= \frac{1}{2}\left[\theta + \frac{\sin 6\theta}{6}\right]_{\pi/6}^{5\pi/6} = \frac{1}{2}\left[\frac{5\pi}{6} - \frac{\pi}{6} + \frac{1}{6}(0-0)\right] = \frac{1}{2} \cdot \frac{4\pi}{6} = \frac{\pi}{3}$

so, Answer is (1)

7

Qu (7) Let $3+4+8+9+13+14+18+\ldots$ (40^{th} term) $= S$

if $S=(102)m$ than $m=$

(1) 20 (2) 25 (3) 10 (4) 5

$S = \underbrace{3+4}+\underbrace{8+9}+\underbrace{13+14}+\underbrace{18+19}+\ldots\ldots\ldots$ 40^{th} term

$S = 7+17+27+37+47+\ldots\ldots\ldots$ 20^{th} term

$S_{40} = \frac{20}{2}[2\times 7+19\times 10] = 10[14+190] = 10[2040]$

$= (102)20 \Rightarrow m = 20$

So, Answer is (1) 20

8

Qu-(8) If $({}^{36}C_{r+1})\times(k^2-3) = {}^{35}C_r$ 6, then number of ordered pair (r,k) are (where $k \in I$)

(1) 6 (2) 2 (3) 3 (4) 4

Sol $\frac{36}{r+1}\times\frac{35}{C_r}(k^2-3) = \frac{35}{C_r}$

$k^2-3 = \frac{r+1}{6} \Rightarrow k^2 = 3+\frac{r+1}{6}$

r can be 5, 35

fo $r=5$, $k = \pm 2$

$r=35$, $k = \pm 3$

Hance number of order pair $= 4$

So, Answer (4) 4

9

9. Let $4\alpha \int_{-1}^{2} e^{-\alpha|x|}\,dx = 5$ then $\alpha = ?$

(1) $\ln 2$ (2) $\ln\sqrt{2}$ (3) $\ln\frac{3}{4}$ (4) $\ln\frac{4}{3}$

Sol $4\alpha\left\{\int_{-1}^{0} e^{\alpha x}\,dx + \int_{0}^{2} e^{-\alpha x}\,dx\right\} = 5$

$\Rightarrow 4\alpha\left\{\left(\frac{e^{\alpha x}}{\alpha}\right)_{-1}^{0} + \frac{e^{-\alpha x}}{-\alpha}\Big|_{0}^{2}\right\} = 5$

$\Rightarrow 4\alpha\left\{\left(\frac{1-e^{-\alpha}}{\alpha}\right) - \left(\frac{e^{-2\alpha}-1}{\alpha}\right)\right\} = 5$

$\Rightarrow 4(2 - e^{-\alpha} - e^{-2\alpha}) = 5$ put $e^{-\alpha} = t$

$\Rightarrow 4t^2 + 4t - 3 = 0$

$\Rightarrow (2t+3)(2t-1) = 0 \quad \Rightarrow e^{-\alpha} = 1/2 \quad \Rightarrow \alpha = \ln 2$

So, Answer is (1) $\ln 2$

10

10. Let $f(x)$ is a Five degree polynomial which has critical point $x = \pm 1$ and $\lim_{x\to 0}\left(2+\frac{f(x)}{x^3}\right)=4$ then which one is incorrecte.

(1) $f(x)$ has minima at $x=1$ and maxima at $x=-1$

(2) $f(1) - 4f(-1) = 4$

(3) $f(x)$ is maxima at $x=1$ and minima at $x=-1$

(4) $f(x)$ is odd

Sol. $f(x) = ax^5 + bx^4 + cx^3$

$\lim_{x\to 0}\left(2+\frac{ax^5+bx^4+cx^3}{x^3}\right) = 4 \Rightarrow 2+c=4 \Rightarrow c=2$

$f'(x) = 5ax^4 + 4bx^3 + 6x^2$

$= x^2(5ax^2 + 4bx + 6)$

$f'(1) = 0 \Rightarrow 5a+4b+6=0$

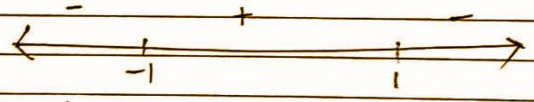
$f'(1) = 0 \Rightarrow 5a-4b+6=0$

$b = 0$

$a = -6/5$

$f(x) = \frac{-6}{5}x^5 + 2x^3$

$f'(x) = -6x^4 + 6x^2 \Rightarrow = 6x^2(-x^2+1) = -6x^2(x+1)(x-1)$



so, minimal at $x=-1$

maxima at $x=1$

so Answer (1) $f(x)$ has minima at $x=1$ and max at $x=-1$

11

Que - (11). If $\vec{a}, \vec{b}, \vec{c}$ are unit vectors such that $\vec{a}+\vec{b}+\vec{c}=0$ and $\lambda = \vec{a}\cdot\vec{b} + \vec{b}\cdot\vec{c} + \vec{c}\cdot\vec{a}$ and $\vec{d} = \vec{a}\times\vec{b} + \vec{b}\times\vec{c} + \vec{c}\times\vec{a}$ than, $(\lambda, \vec{d}) = ?$

(1) $\left(\frac{3}{2}, 3\vec{a}\times\vec{b}\right)$ (2) $\left(\frac{3}{2}, 3\vec{a}\times\vec{c}\right)$ (3) $\left(-\frac{3}{2}, 3\vec{a}\times\vec{c}\right)$

(4) $\left(-\frac{3}{2}, 3\vec{a}\times\vec{b}\right)$

solution $|\vec{a}+\vec{b}+\vec{c}|^2 = 0$

$3 + 2(\vec{a}\cdot\vec{b} + \vec{b}\cdot\vec{c} + \vec{c}\cdot\vec{a}) = 0$

$(\vec{a}\cdot\vec{b} + \vec{b}\cdot\vec{c} + \vec{c}\cdot\vec{a}) = -\frac{3}{2}$

$\Rightarrow \lambda = -3/2$

$\vec{d} = \vec{a}\times\vec{b} + \vec{b}\times(-\vec{a}-\vec{b}) + (-\vec{a}-\vec{b})\times\vec{a}$

$= \vec{a}\times\vec{b} + \vec{a}\times\vec{b} + \vec{a}\times\vec{b}$

$\vec{d} = 3(\vec{a}\times\vec{b})$

So, Answer is (4)

12

Que (12) coefficient of x^7 in $(1+x)^{10} + (1+x)^9 + x^2(1+x)^8 \ldots$ --- x^{10} is -

(1) 330 (2) 210 (3) 420 (4) 260

Sol $\dfrac{(1+x)^{10}\left[1-\left(\frac{x}{1+x}\right)^{11}\right]}{\left(1-\frac{x}{1+x}\right)}$

$\dfrac{(1+x)^{10}\left[(1+x)^{11} - x^{11}\right]}{(1+x)^{11} \times \frac{1}{(1+x)}}$

$= (1+x)^{11} - x^{11}$

coefficient of x^7 is ${}^{11}C_7 = {}^{11}C_4 = 330$

13

13. let α and β are root of $x^2-x-1=0$ such that $P_k=\alpha^k+\beta^k$, $K\geq 1$ then which one is incorrect ?

(1) $P_5=P_2\times P_3$ (2) $P_1+P_2+P_3+P_4+P_5=26$ (3) $P_3=P_5-P_4$ (4) $P_4=11$.

Ans (1)

Sol

$\alpha^5=5\alpha+3$

$\beta^2=5\beta+3$

$P_5=5(\alpha+\beta)+6$

$5(1)+6$

$P_5=11$ and $P_5=\alpha^2+\beta^2=\alpha+1+\beta+1$

$P_2=3$ and $P_3=\alpha^3+\beta^3=2\alpha+1+2\beta+1=2(1)+2=4$

$P_2\times P_3=12$ and $P_5=11$

$\Rightarrow$ $\boxed{P_5\neq P_2\times P_3}$.

14

14. let $f(x)=x^3-4x^2+8x+11$, if LMVT is applicable on $f(x)$ in $[0,1]$, value of C is:

(1) $\frac{4-\sqrt{7}}{3}$ (2) $\frac{4-\sqrt{5}}{3}$ (3) $\frac{4+\sqrt{7}}{3}$ (4) $\frac{4+\sqrt{5}}{3}$

Ans (1)

Sol

$f(x)$ is a polynomial function

It is continous and differntiable in $[0,1]$

Here $f(0)=11$, $f(1)=1-4+8+11=16$

$f'(x)=3x^2-8x+8$

$f'(c)=\frac{f(1)-f(0)}{1-0}=\frac{16-11}{1}=3c^2-8c+8$

$\Rightarrow 3c^2-8c+3=0$

$c=\frac{8\pm 2\sqrt{7}}{6}=\frac{4\pm\sqrt{7}}{3}$

$c=\frac{4-\sqrt{7}}{3}\in(0,1)$.

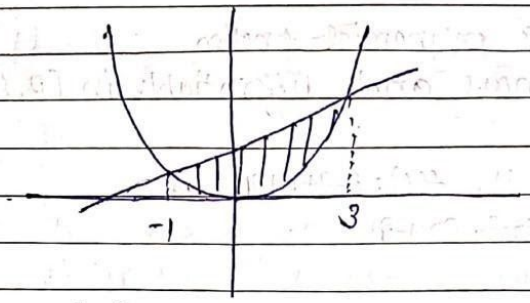
15

15. The area bounded by $4x^2 \le y \le 8x+12$ is

(1) $\frac{127}{3}$ (2) $\frac{128}{3}$ (3) $\frac{129}{3}$ (4) $\frac{125}{3}$

Ans (2)

Sol)



$4x^2 = y$

$y = 8x+12$

$4x^2 = 8x+12$

$x^2 - 2x = 3$

$x^2 - 3x + x - 3 = 0$

$(x+1)(x-3) = 0$

$x = -1 \quad x = 3$

$$A = \int_{-1}^{3} (8x+12-4x^2)\,dx$$

$$A = \frac{8x^2}{2} + 12x - \frac{4x^3}{3}\Big|_{-1}^{3} = \left[4(9)+36-36\right] - \left[4-12+\frac{4}{3}\right]$$

$$= 36 + 8 - \frac{4}{3} = \frac{128}{3}$$

16

16. There are 5 machines. Probability of a machine being faulted is 1/4. Probability at most two machines is faulted is $(3/4)^3 K$ then K is.

(1) 17/2 (2) 4 (3) 17/8 (4) 17/4

Ans (3)

Sol Required probability = when no of machine has fault + when only machine has fault + when only two machines have fault.

$$= {}^5C_0(3/4)^5 + {}^5C_1(1/4)(3/4)^4 + {}^5C_2(1/4)^2(3/4)^3$$

$$= \frac{243}{1024} + \frac{405}{1024} + \frac{270}{1024} = \frac{918}{1024} = \left(\frac{3}{4}\right)^3 \times \frac{17}{8}$$

Compare $\left(\frac{3}{4}\right)^3 K = \left(\frac{3}{4}\right)^3\left(\frac{17}{8}\right)$ $\boxed{K = \frac{17}{8}}$

17

17. $3x + 4y = 12\sqrt{2}$ is the tangent to the ellipse $\frac{x^2}{a^2} + \frac{y^2}{9} = 1$ then the distance between Foci of ellipse is.

(1) $2\sqrt{5}$ (2) $2\sqrt{3}$ (3) $2\sqrt{7}$ (4) 4

Ans (3)

Sol $3x + 4y = 12\sqrt{2}$

$4y = -3x + 12\sqrt{2}$

$\Rightarrow y = \frac{-3}{4}x + 3\sqrt{2}$

Condition of tangency $c^2 = a^2m^2 + b^2$

$18 = a^2.(9/16) + 9 \Rightarrow a^2.(9/16) = 9$

$a^2 = 16$

$a = 4$

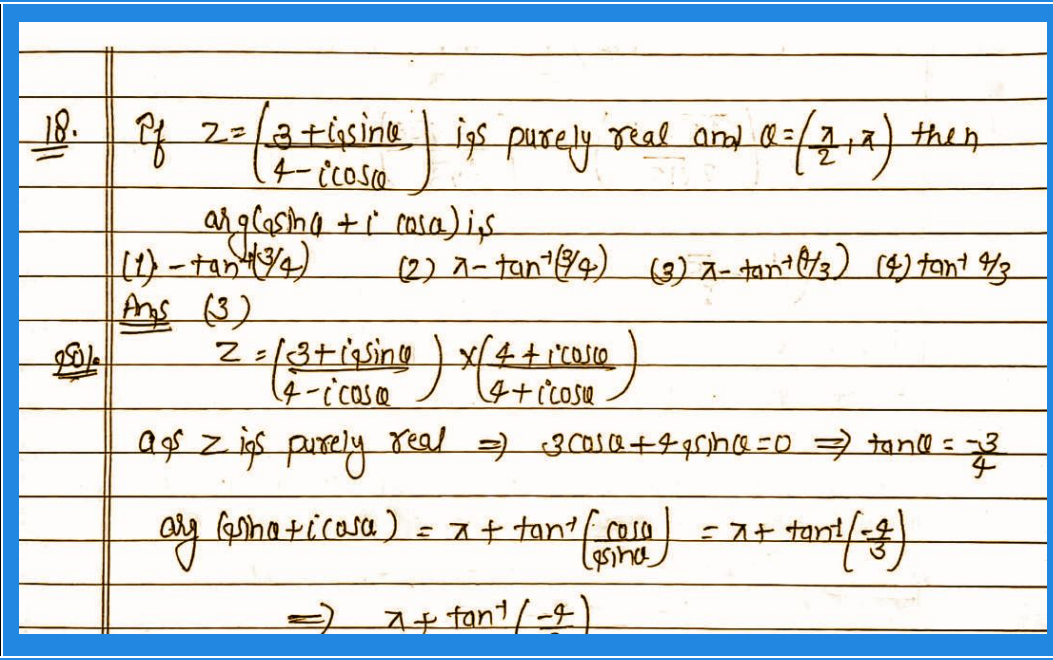
$e = \sqrt{1 - \frac{b^2}{a^2}} = \sqrt{1 - \frac{9}{16}} = \frac{\sqrt{7}}{4}$

$\therefore ae = \frac{\sqrt{7}}{4} \cdot 4 = \sqrt{7}$

foci are $(\pm\sqrt{7}, 0)$

Distance between foci $= 2\sqrt{7}$

18



18. If $z=\left(\frac{3+i\sin\theta}{4-i\cos\theta}\right)$ is purely real and $\theta=\left(\frac{\pi}{2},\pi\right)$ then $\arg(\sin\theta+i\cos\theta)$ is,

(1) $-\tan^{-1}(3/4)$ (2) $\pi-\tan^{-1}(3/4)$ (3) $\pi-\tan^{-1}(3/3)$ (4) $\tan^{-1}4/3$

Ans (3)

Sol. $z=\left(\frac{3+i\sin\theta}{4-i\cos\theta}\right)\times\left(\frac{4+i\cos\theta}{4+i\cos\theta}\right)$

as z is purely real $\Rightarrow 3\cos\theta+4\sin\theta=0 \Rightarrow \tan\theta=\frac{-3}{4}$

$\arg(\sin\theta+i\cos\theta)=\pi+\tan^{-1}\left(\frac{\cos\theta}{\sin\theta}\right)=\pi+\tan^{-1}\left(\frac{-4}{3}\right)$

$\Rightarrow \pi+\tan^{-1}\left(-\frac{4}{3}\right)$

19

19. $a_1, a_2, a_3 \cdots a_9$ are in GP where $a_i < 0$, $a_1 + a_2 = 4$, $a_3 + a_4 = 16$ if $\sum_{i=1}^{9} a_i = 4\lambda$, then λ equ

$a_1, a_2, a_3 \cdots a_9$ are in GP.

(1) -513 (2) $-\frac{511}{3}$ (3) -171 (4) 171

Ans (3)

Sol $a_1 + a_2 = 4 \Rightarrow a_1 + a_1 r = 4$ —— (I)

$a_3 + a_4 = 16 \Rightarrow a_1 r^2 + a_1 r^3 = 16$ —— (II)

$\frac{I}{r^2} + \frac{I}{4} \Rightarrow r^2 = 4 \Rightarrow \boxed{r = \pm 2}$

$r = 2$, $a_1(1+2) = 4$ $a_1 = \frac{4}{3}$

$r = -2$ $a_1(1-2) = -4$ $a_1 = 4$

$\sum_{i=1}^{9} a_i = \frac{a_1(r^9 - 1)}{r - 1} = \frac{4[(-2)^9 - 1]}{-2 - 1} = \frac{4}{3}(-513) = 4\lambda$

$\lambda = -171$

20

20. If $y\sqrt{1-x^2} = k - x\sqrt{1-y^2}$ and $y\left(\frac{1}{2}\right) = -\frac{1}{4}$ Then $\frac{dy}{dx}$ at $x = \frac{1}{2}$

(1) $2/\sqrt{5}$ (2) $-\sqrt{5}/4$ (3) $-\sqrt{5}/2$ (4) $\sqrt{5}/2$

Ans (3)

Solution

$$x = \frac{1}{2} \quad y = -\frac{1}{4} \quad xy = -\frac{1}{8}$$

$$\Rightarrow y \cdot \frac{1}{2\sqrt{1-x^2}}(2x) + y'\sqrt{1-x^2} = \left\{1 \cdot \sqrt{1-y^2} + \frac{x(-2y)}{2\sqrt{1-y^2}}y'\right\}$$

$$\Rightarrow -\frac{xy}{\sqrt{1-x^2}} + y'\sqrt{1-x^2} = \sqrt{1-y^2} + \frac{xyy'}{\sqrt{1-y^2}}$$

$$\Rightarrow y'\left(\sqrt{1-x^2} - \frac{xy}{\sqrt{1-y^2}}\right) = \frac{xy}{\sqrt{1-x^2}} - \sqrt{1-y^2}$$

$$\Rightarrow y'\left(\frac{\sqrt{3}}{2} + \frac{1}{8\left(\frac{\sqrt{15}}{4}\right)}\right) = \frac{-1}{8\left(\sqrt{3}/2\right)} - \frac{\sqrt{15}}{4}$$

$$= y'\left(\frac{\sqrt{15}+1}{2\sqrt{15}}\right) = \left(\frac{1+\sqrt{45}}{4\sqrt{3}}\right)$$

$$= y' = \frac{-\sqrt{5}}{2}$$

21

21. let $X = \{x : 1 \le x \le 50, x \in N\}$

$A = \{x : x \text{ is multiple of } 2\}$

$B = \{x : x \text{ is multiple of } 7$

Then find number of element is smallest subset of X which contain element both A and B.

Solution :- $n(A \cup B) = n(A) + n(B) - n(A \cap B)$

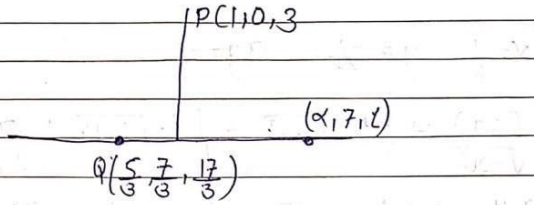
$= 25 + 7 - 3 = 29$

22

22. If $Q(5/3, 7/3, 17/3)$ is foot of perpendicular drawn from a P(1,0,3) on a line L and if line L is passing through $(\alpha, 7, t)$, then value of α is.

Ans. 4.

Solution. Since PQ is perpendicular to L, therefore



$$\left(1-\frac{5}{3}\right)\left(\alpha-\frac{5}{3}\right)+\left(\frac{-7}{3}\right)\left(7-\frac{7}{3}\right)+\left(3-\frac{17}{3}\right)\left(1-\frac{17}{3}\right)=0$$

$$-\frac{2\alpha}{3}+\frac{10}{9}-\frac{98}{9}+\frac{112}{9}=0$$

$$\Rightarrow \frac{2\alpha}{3}=\frac{24}{9} \Rightarrow \boxed{\alpha=4}$$

23

23. If $f(x)$ is defined in $x \in \left(\frac{-1}{3}, \frac{1}{3}\right)$

$$f(x)=\begin{cases}(1/x)\log_e\left(\frac{1+3x}{1-2x}\right) & x\neq 0\\ k & x=0\end{cases}$$ find k such that $f(x)$ is continuous

Ans:- 5

Sol. $\lim\limits_{x\to 0} f(x) \lim\limits_{x\to 0}\left(\frac{1}{x}\ln\left(\frac{1+3x}{1-2x}\right)\right)=\lim\limits_{x\to 0}\left(\frac{\ln(1+3x)-\ln(1-2x)}{x}\right)$

$$=\lim_{x\to 0}\left(\frac{3\ln(1+3x)}{3x}-\frac{2\ln(1-2x)}{-2x}\right)=3+2=5$$

$f(x)$ will be continuous if $f(x)=0 \lim\limits_{x\to 0} f(x)$

24

24. If system of equation
$x+y+z=6$
$x+2y+3z=10$
$3x+2y+\Omega z=\mu$
has more than two solution. find $(\mu-\Omega^2)$

Ans: 13

Sol. $x+y+z=6$ — (1)
$x+2y+3z=10$ — (2)
$3x+2y+\Omega z=\mu$ — (3)
from (1) and (2)
if $z=0$ $x+y=6$ and $x+2y=10$
$\Rightarrow$ Then $y=4$, $x=2$
$(2,4,0)$
if $y=0 \Rightarrow x+z=6$ and $x+3z=10$
$\Rightarrow z=2$ and $x=4$
$(4,0,2)$
so $3x+2y+\Omega z=\mu$
must passs through $(2,4,0)$ and $(4,0,2)$
so $6+8=\mu \Rightarrow \mu=14$
and $12+2\Omega=\mu$
$12+2\Omega=14 \Rightarrow \Omega=1$
so $\mu-\Omega^2=14-1$

25

25 If mean and variance of 2, 3, 16, 20, 13, 7, x, y are 10 and 25 respectively then find xy

Ans: 124

$\text{mean} = \bar{x} = \frac{2+3+16+20+13+7+x+y}{8} = 10 \Rightarrow x+y=19$ — (i)

$\text{variance } \sigma^2 = \frac{\sum (x_i)^2}{8} - (\bar{x})^2 = 25$

$\frac{4+9+256+400+169+49+x^2+y^2}{8} - 100 = 25$

$x^2+y^2=113$ — (ii)

$\Rightarrow (x+y)^2=(19)^2 \Rightarrow x^2+y^2+2xy=361 \Rightarrow xy=124$

Enrolling yourself for coaching classes has long been considered the first step towards cracking the jee. however, this trend is starting to slip. Recent studies show that, for the students who cleared the JEE Main/Advance, the number of students who had joined a coaching class is lower than the number of students who managed the feat with self-study

Preparation for JEE Main/Advance requires a lot of hard work and determination. Be ready to even go through many sleepless nights, missed birthdays and extracurriculars to finish the vast JEE syllabus. But simply completing the syllabus is not enough! If you want to have an edge over your counterparts you need to step up your game. This means practicing a variety of problems and revising diligently while following a meticulous study plan that recognizes your strengths and takes care of all your weaknesses. To get your doubts solved or questions checked there is no better place than Kunduz.

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