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MATHS

BOOKS - IPUCET PREVIOUS YEAR PAPERS

MATHS (HINGLISH)

GGSIPU MATHEMATICS 2005

Mcq

1. The equation of the plane through the intersection of the planes $x + y + z = 1$ and $2x + 3y - z + 4 = 0$ and parallel to x-axis is

A. y-3z+6 = 0

B. 3y-z+6=0

C. y+3z+6=0

D. 3y-2z+6=0

Answer:

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2. If A,B,C,D are (2,3,-1),(3,5,-3),(1,2,3),(3,5,7) respectively, then the angel between AB and CD, is

A. $\frac{x}{2}$

B. $\frac{x}{3}$

C. $\frac{x}{4}$

D. $\frac{x}{6}$

Answer:

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3. If $u = \log\left(\frac{x^2 + y^2}{x + y}\right)$, prove that $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = 1$

A. -1

B. 0

C. 1

D. 2

Answer:

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4. A five digit number is formed by the digit 1,2,3,4 and 5 without repetition. Find the probability that the number formed is divisible by 4.

A. $3/5$

B. $18/5$

C. $1/5$

D. $6/5$

Answer:

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5. Two persons A and B take turns in throwing a pair of dice. The first person to throw 9 from both dice will be awarded the prize. If A throws first, then the probability that B wins the game is $9/17$ b. $8/17$ c. $8/9$ d. $1/9$

A. $9/17$

B. $8/17$

C. $8/9$

D. $1/9$

Answer:

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6. The probability that in a year of $22nd$ centurychosen at random, there will be 53 Sundays is

A. $3/28$

B. $2/28$

C. $7/28$

D. $5/28$

Answer:

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7. The standard deviationof a variable x is 10.Then the standard deviation of 50+5x is :

A. 50

B. 550

C. 10

D. 0.98

Answer:

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8. The octal equivalent of the decimal number 0.3125 is :

A. 0.24

B. 0.42

C. 0.39

D. 0.98

Answer:

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9. The hexadecimal equivalent of the binary number 111100001010001 is

A. 15C3

B. C351

C. 3C51

D. C315

Answer:

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10. A real value of x satisfies the equation $\frac{3-4ix}{3+4ix} = \alpha - i\beta(\alpha, \beta \in R)$, if $\alpha^2 + \beta^2 =$

A. $\alpha^2 - \beta^2 = -1$

B. $\alpha^2 - \beta^2 = 1$

C. $\alpha^2 + \beta^2 = 1$

D. $\alpha^2 - \beta^2 = 2$

Answer:

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11. If P, Q, R, S are represented by the complex number $4+i, 1+6i, -4+3i, -1-2i$ respectively, then $PQRS$ is a (A) rectangle (B) square (C) rhombus (D) parallelogram

A. rectangle

B. square

C. rhombus

D. parallelogram

Answer:

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12. If n is a positive integer, then $(1+i)^n + (1-1)^n$ is equal to

A. $\sqrt{2}^{n-2} \cos\left(\frac{n\pi}{4}\right)$

B. $\sqrt{2}^{n-2} \sin\left(\frac{n\pi}{4}\right)$

C. $\sqrt{2}^{n+2} \cos\left(\frac{n\pi}{4}\right)$

D. $\sqrt{2}^{n+2} \sin\left(\frac{n\pi}{4}\right)$

Answer:

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13. The number of ways in which 9 persons can be divided into three equal groups is

A. 1680

B. 840

C. 560

D. 280

Answer:

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14. A dictionary is printed consisting of 7 lettered words only that can be made with letters of the word "CRICKET". If the words are printed in the alphabetical order, as in the ordinary dictionary, then the number of words before the word CRICKET, is

A. 530

B. 480

C. 531

D. 481

Answer:

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15. If the sum of the coefficient in the expansion of $x + y^n$ is 1024, then the value of the greatest coefficient in the expansion is :

A. 356

B. 252

C. 210

D. 120

Answer:

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16. The value of the determinant $\begin{vmatrix} 10! & 11! & 12! \\ 11! & 12! & 13! \\ 12! & 13! & 14! \end{vmatrix}$, is

A. 10! 11!

B. 10!13!

C. 10!11!12!

D. 11!12!13!

Answer:

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17. If A and B are two matrices such that AB=B and BA=A, then

A. $A^2 = A \text{ and } B^2 \neq B$

B. $A^2 \neq A \text{ and } B^2 = B$

C. $A^2 = A \text{ and } B^2 = B$

D. $A^2 \neq A \text{ and } B^2 \neq B$

Answer:

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18. If the points $(x_1, y_1), (x_2, y_2)$ and (x_3, y_3) are collinear, then the rank of the matrix $\begin{bmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{bmatrix}$ will always be less than

A. 2

B. 3

C. 1

D. none of these

Answer:

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19. Consider the system of equations

$x + y + z = 6$

$x + 2y + 3z = 10$

$x + 2y + \lambda z = \mu$

The system has no solution if

A. $\lambda = 3, \mu = 10$

B. $\lambda = 3, \mu \neq 10$

C. $\lambda \neq 3, \mu \neq 10$

D. none of these

Answer:

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20. If $A = \begin{vmatrix} \sin(\theta+\alpha) & \cos(\theta+\alpha) & 1 \\ \sin(\theta+\beta) & \cos(\theta+\beta) & 1 \\ \sin(\theta+\gamma) & \cos(\theta+\gamma) & 1 \end{vmatrix}$, then

A. A = 0 for all θ

B. A is a odd function of θ

C. A = 0 for $\theta = \alpha + \beta + \gamma$

D. A is a independent of θ

Answer:

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21. An investigator interviewed 100 students to determine the performance of three drinks: milk , coffee and tea the in vestigotor reported that 10 students take all three drinks

milk . Coffe and tea , 20 students take take coffe , 25 students take milk only , 5 students take coffee only and 8 students take tea only . then the number of students who did not take any of these drinks is

A. 10

B. 20

C. 25

D. 30

Answer:

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22. Let $Y = (1, 2, 3, 4, 5\}, A = \{1, 2). B = (3, 4, 5)$ If $(A \times B)$ denotes Cartesian product of the set A and B, then number of elements in $(Y \times A) \cap (Y \times B)$ is _____

A. Y

B. A

C. B

D. ϕ

Answer:

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23. Let A = {1, 2, 3, 4, 5, ..., 17, 18}. Let ' $\cong$ ' be the equivalence relation on $A \times A$, cartesian product of A with itself, defined by (a,b) $\cong$ (c, d) iff ad = bc. Then, the number of ordered pairs of the equivalence class of (3, 2) is

A. 4

B. 5

C. 6

D. 7

Answer:

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24. If a, b are two fixed positive integers such that $f(a+x)=b+\left[b^3+1-3b^2f(x)+3b\{f(x)\}^2-\{f(x)\}^3\right]^{\frac{1}{3}}$ for all real x, then prove that $f(x)$ is periodic and find its period.

A. a

B. 2a

C. 1b

D. 2b

Answer:

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25. the domain of the function

$f(x) = \log_{3+x}\left(x^2 - 1\right)$ is

A. $-3, \ -1 \cup 1, \infty$

B. $[-3, \ -1] \cup [1, \infty]$

C. $-3, \ -2 \cup \ -2, \ -1 \cup 1, \infty$

D. $[-3, \ -2 \cup \ -2, \ -1 \cup 1, \infty$

Answer:

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26. The value of $\cot 70^\circ + 4\cos 70^\circ$ is

A. $1/\sqrt{3}$

B. $\sqrt{3}$

C. $2\sqrt{3}$

D. $1/2$

Answer:

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27. The equation of sinx+siny+sinz = - 3 for $0 \leq x \leq 2\pi, 0 \leq y \leq 2\pi, 0 \leq z \leq 2\pi$ has :

A. one solution

B. two sets of solution

C. four sets of solution

D. no solution

Answer:

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28. If $x \geq 0$ and $\theta = \sin^{-1} x + \cos^{-1} x - \tan^{-1} x$, then

A. $\frac{\pi}{2} \leq \theta \leq \frac{3\pi}{4}$

B. $0 \leq \theta \leq \frac{\pi}{4}$

C. $-\frac{\pi}{4} \leq \theta \leq 0$

D. $\frac{\pi}{4} \leq \theta \leq \frac{\pi}{2}$

Answer:

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29. Let A, B and C are the angles of a plain triangle and $\tan\left(\frac{A}{2}\right) = \frac{1}{3}, \tan\left(\frac{B}{2}\right) = \frac{2}{3}$ .then $\tan\left(\frac{C}{2}\right)$ is equal to

A. $7/9$

B. $2/9$

C. $1/3$

D. $2/3$

Answer:

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30. If $\alpha, \beta\alpha \neq \beta$ satisfies the question a $\cos\theta + b\sin\theta = c$, then the value of tan $\left(\frac{\alpha+\beta}{2}\right)$ is :

A. b/a

B. c/a

C. a/b

D. c/b

Answer:

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31. The equation $4x^2 - 24xy + 11y^2 = 0$ represents

A. two parallel lines

B. two perpendicular lines

C. two lines through the origin

D. a circle

Answer:

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32. The length of the chord joining the points in which the straight line $\frac{x}{3}+\frac{y}{4}=1$ cuts the circle $x^2+y^2=\frac{169}{25}$ is :

A. 1

B. 2

C. 4

D. 8

Answer: B

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33. The normal to the parabola $y^2 = 8x$ at the point (2, 4) meets the parabola again at the point-

A. $-18.\ -12$

B. $-18, 12$

C. $18, 12$

D. -12

Answer:

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34. If a bar of givenlength moves with its extremities on two fixed straight lines at right angles,then the locus of any point on bar marked on the bar describes a/an :

A. circle

B. parabola

C. ellipse

D. hyerbola

Answer:

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35. The straight line $x + y = \sqrt{2}P$ will touch the hyperbola $4x^2 - 9y^2 = 36$ if (a) $p^2 = 2$ (b) $p^2 = 5$ (c) $5p^2 = 2$

A. $p^2 = 2$

B. $p^2 = 5$

C. $5p^2 = 2$

D. $2p^2 = 5$

Answer:

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36. The function $f(x) = \frac{1 - \sin x + \cos x}{1 + \sin x + \cos x}$ is not defined at $x = \pi$. The value of $f(\pi)$, so that f(x) is continuous at $x = \pi$ is

A. $-1/2$

B. $1/2$

C. -1

D. 1

Answer:

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37. If $f(x) = \sin^2 x$ and the composite functions $g\{f(x)\} = |\sin x|$, then the function $g(x) =$

A. $\sqrt{x-1}$

B. $\sqrt{x}$

C. $\sqrt{x+1}$

D. $-\sqrt{x}$

Answer:

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38. The area bounded by the curve $y = |x-1|$ and $y = 3 - |x|$

A. 1sq. Units

B. 2sq. Units

C. 3sq. Units

D. 4sq. Units

Answer:

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39. Let $x = \left[\frac{a+2b}{a+b}\right]$ and $y = \frac{a}{b}$, where a and b are positive integers . If $y^2 > 2$, then

A. $x^2 \leq 2$

B. $x^2 < 2$

C. $x^2 > 2$

D. $x^2 \geq 2$

Answer:

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40. The curve $x = \log y + e$ and $y = \log\left(\frac{1}{x}\right)$

A. do not meet

B. meet at one point

C. meet at two points

D. meet at more than two points

Answer:

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41. $\lim_{x \to 0} \frac{\cos(\sin x) - 1}{x^2}$ equals :

A. 0

B. -1

C. $1/2$

D. $-1/2$

Answer:

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42. Let $\vec{a}, \vec{b}, \vec{c}$ be three vectors from $\vec{a} \times \left(\vec{b} \times \vec{c}\right) = \left(\vec{a} \times \vec{b}\right) \times \vec{c}$, if

A. $\vec{b} \times \vec{a} \times \vec{c} = 0$

B. $\vec{a} \times \vec{c} = \vec{b}$

C. $\vec{c} \times \vec{a} = \vec{a} \times \vec{b}$

D. $\vec{c} \times \vec{a} = \vec{b} \times \vec{a}$

Answer:

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43. If $\hat{i}, \hat{j}, \hat{k}$ are units vectors and $\left|\vec{a}\right| = a$, then the value of $\left|\hat{i} \times \left|\vec{a}\right|\right|^2 + \left|\hat{j} \times \left|\vec{a}\right|\right|^2 + \left|\hat{k} \times \left|\vec{a}\right| \right|^2$ is :

A. a^2

B. $3a^2$

C. $2a^2$

D. $4a^2$

Answer:

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44. If the area above the x-axis, bounded by the curves $y = 2^{kx}$ and x = 0, and x = 2 is $\frac{3}{\log_e(2)}$, then the value of k is

A. $1/2$

B. 1

C. -1

D. 2

Answer:

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45. The value fo $\int_a^b \frac{x}{|x|} dx, a < b < 0$ is :

A. $|a| + |b|$

B. $|b| - |a|$

C. $|a| - |b|$

D. $|a| + |b|$

Answer:

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46. The value $\int_{-2}^{2}\left(p\log\left(\frac{1+x}{1-x}\right)+q\log\left(\frac{1-x}{1+x}\right)^{-2}+r\right)dx$ depends on the value of

A. the value of p

B. the value of q

C. the value of r

D. the value of p and q

Answer:

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47. A curve having the condition that the slope of the tangent at some point is two times the slope of the straight line joining the same point to the origin of coordinates is a/an

A. circle

B. ellipse

C. parabola

D. hyperbola

Answer:

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48. If a an arbitrary constant, then solution of the differential equation $\frac{dy}{dx} + \sqrt{\frac{1-y^2}{1-x^2}} = 0$ is

A. $x\sqrt{1-y^2} + y(1-x^2) = a$

B. $y\sqrt{1-y^2} + x\sqrt{1-x^2} = a$

C. $x(1-y^2) - y\sqrt{1-x^2} = a$

D. $y\sqrt{1-y^2} - x\sqrt{1-x^2} = a$

Answer:

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49. A particle is moving along the curve $x = at^2 + bt + c$. If $ac = b^2$, then particle would be moving with uniform

A. rotation

B. velocity

C. acceleration

D. retardation

Answer:

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50. The unit vector $\vec{a}$ and $\vec{b}$ are perpendicular, and the unit vector $\vec{c}$ is inclined at an angle θ to both $\vec{a}$ and $\vec{b}$. If $\vec{c} = \alpha\vec{a} + \beta\vec{b} + \gamma\left(\vec{a} \times \vec{b}\right)$, then which one of the following is incorrect?

A. $\alpha = \cot\theta, \beta = \sin\theta, \gamma^2 = \cos 2\theta$

B. $\alpha \cos\theta, \beta = \cos\theta, \gamma^2 = \cos 2\theta$

C. $\alpha = \cos\theta, \beta = \sin\theta, \gamma^2 = \cos 2\theta$

D. $\alpha = \sin\theta, \beta = \cos\theta \gamma^2 = -\cos 2\theta$

Answer:

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51. Let R be the set of real numbers and $f: R \to R$ be such that for all x and y in R, $f(x) - f(y) \mid^2 \leq (x - y)^3$. Prove that f(x) is a constant.

A. 5

B. 7

C. 9

D. 11

Answer:

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52. If $f(x) = \frac{1}{1-x}$, then the derivative of the composite function f[f{f(x)}]` is equal to

A. 0

B. $1/2$

C. 1

D. 2

Answer:

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