



MATHS

BOOKS - IPUCET PREVIOUS YEAR PAPERS MATHS (HINGLISH)

GGSIU MATHEMATICS 2006

Mcq

1. if the regression coefficient of Y on X is $\frac{4}{3}$, then the regression coefficient of X and Y

:

A. is $\frac{3}{4}$

B. is less than $\frac{3}{4}$

C. is less than 1

D. can take any value

Answer:



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2. Which of the following is the inverse of the proposition 'If a number is a prime then it is odd' ?

A. If a number is not a prime then it is odd

B. If a number is not a prime then it is not odd

C. If a number is not odd then it is not a prime

D. If a number is odd then it is a prime

Answer:



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3. What must be the matrix X if

$$2X + \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} = \begin{bmatrix} 3 & 8 \\ 7 & 2 \end{bmatrix} ?$$

A. $\begin{bmatrix} 1 & 3 \\ 2 & -1 \end{bmatrix}$

B. $\begin{bmatrix} 1 & -3 \\ 2 & -1 \end{bmatrix}$

C. $\begin{bmatrix} 2 & 6 \\ 4 & -2 \end{bmatrix}$

D. $\begin{bmatrix} 2 & -6 \\ 4 & -2 \end{bmatrix}$

Answer:



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4. The value of $\begin{vmatrix} 1 & 1 & 1 \\ bc & ca & ab \\ b+c & c+a & a+b \end{vmatrix}$ is :

A. 1

B. 0

C. $(a - b)(b - c)(c - a)$

D. $(a + b)(b + c)(c + a)$

Answer: C



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5. The value of $\begin{vmatrix} 441 & 442 & 443 \\ 445 & 446 & 447 \\ 449 & 450 & 451 \end{vmatrix}$ is :

A. $441 \times 446 \times 4510$

B. 0

C. -1

D. 1

Answer: B



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6. $(\vec{a} \hat{i}) \hat{i} + (\vec{a} \hat{j}) \hat{j} + (\vec{a} \hat{k}) \hat{k}$ is value of :

A. $|\hat{i}|$

B. $2|\vec{a}|$

C. $3|\vec{a}|$

D. $|\vec{a}|$

Answer:



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7. Inverse of the matrix $\begin{bmatrix} \cos 2\theta & -\sin 2\theta \\ \sin 2\theta & \cos 2\theta \end{bmatrix}$ is

A. $\begin{bmatrix} \cos 2\theta & -\sin 2\theta \\ \sin 2\theta & \cos 2\theta \end{bmatrix}$

B. $\begin{bmatrix} \cos 2\theta & \sin 2\theta \\ \sin 2\theta & -\cos 2\theta \end{bmatrix}$

C. $\begin{bmatrix} \cos 2\theta & \sin 2\theta \\ \sin 2\theta & \cos \theta \end{bmatrix}$

D. $\begin{bmatrix} \cos 2\theta & \sin 2\theta \\ -\sin 2\theta & \cos 2\theta \end{bmatrix}$

Answer:



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8. If $|\vec{a}| = 3$, $|\vec{b}| = 4$, then a value of λ for which $\vec{a} + \lambda \vec{b}$ is perpendicular to $\vec{a} - \lambda \vec{b}$ is :

A. $\frac{9}{16}$

B. $\frac{3}{4}$

C. $\frac{3}{2}$

D. $\frac{4}{2}$

Answer: B



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9. A line passes through the point $(6, -7, -1)$ and $(2, -3, 1)$. The direction cosines of the line so directed that the angle made by it with the positive direction of x-axis is acute, are

A. $\frac{2}{3}, -\frac{2}{3}, -\frac{1}{3}$

B. $-\frac{2}{3}, \frac{2}{3}, \frac{1}{3}$

C. $\frac{2}{3}, -\frac{2}{3}, \frac{1}{3}$

D. $\frac{2}{3}, \frac{2}{3}, \frac{1}{3}$

Answer:



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10. The maximum of the function $3\cos x - 4\sin x$ is :

A. 2

B. 3

C. 4

D. 5

Answer: D



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11. If the distance s metre traversed by a particle in t seconds is given by $s = t^3 - 3t^2$, then the velocity of the particle when the acceleration is zero, in metre/second is

A. 3

B. -2

C. -3

D. 2

Answer:



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12. For the curve $y^n = a^{n-1}x$ if the subnormal at any point is a constant, then n is equal to

A. 1

B. 2

C. -2

D. -1

Answer:



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13. If $a = A \cos 4t + B \sin 4t$, then $\frac{d^2x}{dt^2}$ is equal to

A. $-16x$

B. $16x$

C. x

D. $-x$

Answer:



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14. If tangent to the curve $x = at^2$, $y = 2at$ is perpendicular to X-axis, then its point of contact is

A. a, a

B. $0, a$

C. 0,0

D. a,0

Answer:



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15. The general solution of the differential

equation $\frac{dy}{dx} + \frac{1 + \cos 2y}{1 - \cos 2x} = 0$ is given by

A. $\tan y \cot x = c$

B. $\tan y - \cot x = c$

C. $\tan x - \cot y = c$

D. $\tan x + \cot y = c$

Answer:



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16. The area enclosed between the curves

$y = x^3$ and $y = \sqrt{x}$ is

A. $\frac{5}{3}$

B. $\frac{5}{4}$

C. $\frac{5}{12}$

D. $\frac{12}{5}$

Answer:



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17. $\int_0^{\pi/8} \cos^3 4\theta d\theta =$

A. $\frac{5}{3}$

B. $\frac{5}{4}$

C. $\frac{1}{3}$

D. $\frac{1}{6}$

Answer:



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18. $\int_0^{\pi/2} \frac{\cos x - \sin x}{1 + \cos x \sin x} dx$ is equal to

A. 0

B. $\frac{\pi}{2}$

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

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

Answer:



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19. If $ax^2 - y^2 + 4x - y = 0$ represents a pair of lines, then a is equal to

A. -16

B. 16

C. 4

D. -4

Answer:



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20. What is the equation of the locus of a point which moves such that 4 times its distance from the x-axis is the square of its distance from the origin

A. $x^2 + y^2 - 4y = 0$

B. $x^2 + y^2 - 4 = 0$

C. $x^2 + y^2 - 4x = 0$

$$D. x^2 + y^2 - 4x = 0$$

Answer:



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21. If the area of the triangle with vertices $x, 0, 1, 1$ and $0, 2, 1, 4$ sq units, then the value of x is :

A. -2

B. -4

C. -6

D. 8

Answer:



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22. $\lim_{\theta \rightarrow \frac{\pi}{2}} \frac{\frac{\pi}{2} - \theta}{\cot \theta}$ is equal to

A. 0

B. -1

C. 1

D. ∞

Answer:



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23. The probability that A can solve a problem is $\frac{4}{5}$ and B can solve it is $\frac{2}{3}$. If both attempt the problem what is the probability that exactly one of the problem gets solved ?



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24. If the foci of the ellipse $\frac{x^2}{16} + \frac{y^2}{b^2} = 1$ and the hyperbola $\frac{x^2}{144} - \frac{y^2}{81} = \frac{1}{25}$ coincide write the value of b^2 .

A. 1

B. 7

C. 5

D. 9

Answer:



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25. The differential coefficient of $f(\sin x)$ with respect to x , where $f(x)=\log x$, is

A. $\tan x$

B. $\cot x$

C. $f(\cos x)$

D. $\frac{1}{x}$

Answer:



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26. If $f(x) = \begin{cases} \frac{1 - \cos x}{x}, & x \neq 0 \\ k, & x = 0 \end{cases}$ is continuous

at $x = 0$, then the value of k is

A. 0

B. $\frac{1}{2}$

C. $\frac{1}{4}$

D. $-\frac{1}{2}$

Answer:



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27. If $y = \tan^{-1}(\sec x - \tan x)$, then $\frac{dy}{dx}$ is equal to

A. 2

B. -2

C. $\frac{1}{2}$

D. $-\frac{1}{2}$

Answer:



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28. If $x + \frac{1}{x} = 2 \cos \theta$, then $x^n + \frac{1}{x^n}$ is equal to

A. $2^n \cos \alpha$

B. $2^n \cos n \alpha$

C. $2i \cos n \alpha$

D. $2 \cos n \alpha$

Answer:



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29. The value of $\int_{-1}^1 |1 - x| dx$ is equal to -

A. -2

B. 0

C. 2

D. 4

Answer:



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30. If a sphere of constant radius k passes through the origin and meets the axis in A,B,C then the centroid of the triangle ABC lies on :

A. $x^2 + y^2 + z^2 = k^2$

B. $x^2 + y^2 + z^2 = 4k^2$

C. $9x^2 + y^2 + z^2 = 4k^2$

D. $9x^2 + y^2 + z^2 = k^2$

Answer:



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31. $\int \frac{dx}{x^2 + 2x + 2}$ is equal to

A. $\sin^{-1} x + 1 + c$

B. $\sinh^{-1} x + 1 + c$

C. $\tanh^{-1} x + 1 + c$

D. $\tan^{-1} x + 1 + c$

Answer: D



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32. If the tangent to the curve $y = 6x - x^2$ is parallel to line $4x - 2y - 1 = 0$, then the point of tangency on the curve is

A. 2,8

B. 8,2

C. 6,1

D. 4,2

Answer:



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33. A four figure number is formed of the figures 1, 2, 3, 4, 5 with no repetitions. The probability that the number is divisible by 5 is $\frac{3}{4}$ b. $\frac{1}{4}$ c. $\frac{1}{8}$ d. none of these

A. $\frac{3}{4}$

B. $\frac{1}{4}$

C. $\frac{1}{8}$

D. none of these

Answer:



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34. The number of solutions for the equation

$$x^2 - 5|x| + 6 = 0 \text{ is :}$$

A. 4

B. 3

C. 2

D. 1

Answer:



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35. How many numbers of 6 digits can be formed from the digits of number 1; 1; 2; 2; 3; 3 ?

A. 30

B. 60

C. 90

D. 120

Answer:



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36. The last digit of 7^{2003} is

A. 7

B. 9

C. 1

D. 3

Answer:



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37. If $\frac{\log x}{a - b} = \frac{\log y}{b - c} = \frac{\log z}{c - a}$, then xyz is equal to :

A. 0

B. 1

C. - 1

D. 2

Answer: B



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38. What is the smallest positive integer n for which $(1 + i)^{2n} = (1 - i)^{2n}$?

A. 1

B. 2

C. 3

D. 4

Answer:



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39. If $\cos^{-1} p + \cos^{-1} q + \cos^{-1} r = 3\pi$, then

$p^2 + q^2 + r^2 + 2pqr$ is equal to

A. 3

B. 1

C. 2

D. -1

Answer:



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40. If $\sin^{-1}\left(\frac{x}{5}\right) + \cos ec^{-1}\left(\frac{5}{4}\right) = \frac{\pi}{2}$, then

the value of x is

A. 1

B. 4

C. 3

D. 5

Answer:



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41. if $0 \leq x \leq \pi$ and $81^{\sin^2 x} + 81^{\cos^2 x} = 30$

then $x =$

A. $\frac{\pi}{6}$

B. $\frac{\pi}{2}$

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

D. $\frac{3\pi}{4}$

Answer:



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42. The equation of the director circle of the hyperbola $\frac{x^2}{16} - \frac{y^2}{4} = 1$ is given by :

A. $x^2 + y^2 = 16$

B. $x^2 + y^2 = 4$

C. $x^2 + y^2 = 20$

D. $x^2 + y^2 = 12$

Answer:



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43. Let Q be the set of all rational numbers and $*$ be the binary operation, defined by $a * b = a + ab$ for all $a, b \in Q$. then,

A. 1

B. 0

C. -1

D. 2

Answer:



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44. The circle $x^2 + y^2 - 8x + 4y + 4 = 0$

touches

A. x - axis

B. y-axis

C. both axis

D. neither x - axis nor y-axis

Answer:



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45. If $f(x) = \log(1+x) - \frac{2x}{2+x}$ is increasing, then.....

A. $0, \infty$

B. $-\infty, 0$

C. $-\infty, \infty$

D. none of these

Answer:



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46. The minimum value of

$$\left(1 + \frac{1}{\sin^n \alpha}\right) \left(1 + \frac{1}{\cos^n \alpha}\right) \text{ is}$$

A. 1

B. 2

C. 1+2

D. none of these

Answer:



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47. $\lim_{x \rightarrow \infty} \left(1 - \frac{4}{x-1}\right)^{3x-1}$ is equal to

A. e^{12}

B. e^{-12}

C. e^4

D. e^3

Answer:



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48. If $A + B + C = 180^\circ$, then

$\Sigma \tan. \frac{A}{2} \tan. \frac{B}{2}$ is

A. 0

B. 1

C. 2

D. 3

Answer:



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49. In a triangle ABC if $b = 2$, $B = 30^\circ$ then the area of the circumcircle of triangle ABC in square units is :

A. π

B. 2π

C. 4π

D. 6π

Answer: C



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50. if $\sin x + \sin^2 x = 1$ then

$$\cos^{12} x + 3 \cos^{10} x + 3 \cos^8 x + \cos^6 x =$$

A. 1

B. 2

C. 3

D. 0

Answer:



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51. If R denotes the set of all real number, then the function $f: R \rightarrow R$ defined $f(x) = |x|$ is :

- A. one-one only
- B. onto only
- C. both one - one and onto
- D. neither one-one nor onto

Answer:



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