MATHS

BOOKS - IPUCET PREVIOUS YEAR PAPERS MATHS (HINGLISH)

GGSIPU MATHEMATICS 2004

Mcq

1. IF the angle between the pair of straight lines represented by the equation $x^2 - 3xy + \lambda y^2 + 3x - 5y + 2 = 0$ is $\tan^{-1}\left(\frac{1}{3}\right)$, where λ is non-negative real number, then value of λ is

A. 2

B. 0

C. 3

D. 1

Answer:

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2. distance of the lines $2x - 3y - 4 = 0$ from the point $(1, 1)$ measured paralel to the line $x + y = 1$ is

A. $\sqrt{2}$

B. $5/\sqrt{2}$

C. $1/\sqrt{2}$

D. 6

Answer:

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3. The equations of bisectors of the angles between the lines $|x| = |y|$ are

A. $y = \pm x$ and $x = 0$

B. $x = \frac{1}{2}$ and $y = \frac{1}{2}$

C. y=0 and x = 0

D. none of these

Answer:

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4. The base of vertices of an isosceles triangle PQR are Q 1,3 and R -2,7.The vertex p can be :

A. 1,6

B. $\frac{1}{2}, 5$

C. $\frac{5}{6}, 6$

D. `none of these

Answer:

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5. The normal at the point (3, 4) on a circle cuts the circle at the point (-1,-2). Then the equation of the circle is

A. $x^2 + y^2 + 2x - 2y - 13 = 0$

B. $x^2 + y^2 - 2x - 2y - 11 = 0$

C. $x^2 + y^2 - 2x + 2y + 12 = 0$

D. $x^2 + y^2 - 2x - 2y + 14 = 0$

Answer:

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6. If $\cos P = \frac{1}{7}$ and $\cos Q = \frac{13}{14}$, whera P and Q both are acute angles. Then the value of P-Q is

A. 30°

B. 60°

C. 45°

D. 75°

Answer:

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7. The equation 3 cos x + 4 sin x = 6 has ..... Solution

A. finite

B. infinite

C. one

D. no

Answer:

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8. If $\sec^{-1} x = \operatorname{cosec}^{-1} y$ then $\frac{\cos^{-1}(1)}{x} + \frac{\cos^{-1}(1)}{y}$=

A. π

B. $\pi/4$

C. $-\pi/2$

D. $\pi/2$

Answer:

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9. If 'n' be any integer ,then $n(n+1)(2n+1)$ is :

A. odd number

B. integral

C. perfect square

D. does not

Answer:

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10. If $\tan\theta = -\frac{4}{3}$, then $\sin\theta$ is

A. $-\frac{4}{5}$ but $\neq \frac{4}{5}$

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

C. $\frac{4}{5}$ but $\neq -\frac{4}{5}$

D. $\frac{1}{5}$

Answer:

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11. If $C = 2\cos\theta$, then the value of the determinant $\Delta = \begin{vmatrix} C & 1 & 0 \\ 1 & C & 1 \\ 6 & 1 & c \end{vmatrix}$, is

A. $\frac{\sin 4\theta}{\sin\theta}$

B. $\frac{2\sin^2 2\theta}{\sin\theta}$

C. $4\cos^2\theta 2\cos\theta - 1$

D. none of these

Answer:

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12. The set of values of x for which the inequality $|x-1|+|x+1|<4$ always holds true, is

A. 2,2

B. $-\infty, 2 \cup 2, \infty$

C. $-\infty, 1] \cup [1, \infty$

D. none of these

Answer:

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13. Equation of the parabola, whose vertex is $(-1, -2)$, axis is vertical and which passes through the point $(3, 6)$, is

A. $x^2 + 2x - 2y - 3 = 0$

B. $2x^2 = 3y$

C. $x^2 - 2x + 2y + 3 = 0$

D. $x^2 - 2x - 2y - 3 = 0$

Answer:

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14. The length of the axes of the conic $9x^2 + 4y^2 - 4y + 1 = 0$, are

A. $\frac{1}{2}, 9$

B. $3, \frac{2}{5}$

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

D. $3, 2$

Answer:

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15. If $f(x) = \cot^{-1}\left(\frac{3x - x^3}{1 - 3x^2}\right)$ and $g(x) = \cos^{-1}\left(\frac{1 - x^2}{1 + x^2}\right)$

then $\lim_{x \to a} \frac{f(x) - f(a)}{g(x) - g(a)}, 0 < \frac{1}{2}$ is :

A. $\frac{3}{2(1 + a^2)}$

B. $\frac{3}{2(1 + x^2)}$

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

D. $-\frac{3}{2}$

Answer:

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16. If fx = $\begin{cases} x & x \leq \\ 2x - 1 & 1 < x \end{cases} x \leq 1$then :

A. f is discontinous at x = 1

B. f is differentiable at x = 1

C. c is continous but not different at x = 1

D. none of these

Answer:

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17. $\lim_{x \to -2} \frac{\sin^{-1}(x+2)}{x^2+2x}$ is equal to

A. 0

B. ∞

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

D. none of these

Answer:

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18. The derivative of $f(x) = 3|2 + x|$ at the point $x_0 = -3$ is

A. 3

B. -3

C. 0

D. none of these

Answer:

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19. Derivative of the function $f(x) = \log_5(\log_7(x))$ and $x > 7$ is :

A. $\frac{1}{(x \log 5)(\log 7)(\log_7 x)}$

B. $\frac{1}{x(\log 5)(\log 7)}$

C. $\frac{1}{x \log x}$

D. none of these

Answer:

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20. If $z = x + iy$, $z^{1/3} = a - ib$, then $\frac{x}{a} - \frac{y}{b} = ka^2 - b^2$, where k is equal to :

A. 1

B. 2

C. 3

D. 4

Answer:

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21. The number of real solutions of the equation $1 + |e^x - 1| = e^x(e^x - 2)$ is :

A. 1

B. 2

C. 4

D. 8

Answer: B

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22. If $u = x^2 + y^2$ and $x = s + 3t, y = 2s - t,$ then $\frac{d^2u}{ds^2}$ is equal to

A. 12

B. 10

C. 32

D. 36

Answer:

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23. If the equation $x^2 + qx + p = 0$ have a common root then p+q+1 is equal to :

A. 0

B. 1

C. 2

D. -1

Answer:

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24. Let z_1, z_2, z_3 be three vertices of an equilateral triangle circumscribing the circle $|z| = \frac{1}{2}$. If $z_1 = \frac{1}{2} + \frac{\left(\sqrt{3}\right)i}{2}$ and z_1, z_2, z_3 were in anticlockwise sense then z_2 is

A. $1 + \sqrt{3i}$

B. $1 - \sqrt{3i}$

C. 1

D. -1

Answer:

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25. If $z = \frac{-2}{1 + \sqrt{3i}}$, then the value of age z is

A. π

B. $\pi/3$

C. $2\pi/3$

D. $\pi/4$

Answer:

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26. The locus of the point z satisfying $\arg\left[\frac{z-1}{z+1}\right] =$ k,where k is non zero is :

A. a circle with centre on y - axis

B. circle with centre on x - axis

C. a straight line parallel to x- axis

D. a straight line making an angle 60° with the x - axis

Answer:

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27. If P(3,4,5),Q(4,6,3) ,R (-1,2,4) ,S(1,0,5) ,then the projection of RS on PQ is :

A. $-2/3$

B. $4/3$

C. $1/2$

D. 2

Answer:

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28. If a line makes α, β, γ with the positive direction of x,y,z-axis respectively . Then $\cos^2\alpha + \cos^2\beta + \cos^2\gamma$ is equal to :

A. $1/2$

B. $-1/2$

C. -1

D. 1

Answer:

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29. The projection of a line segment on the coordinate axes are 2,3,6. Then the length of the line segment is

A. 7

B. 5

C. 1

D. 11

Answer:

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30. The decimal equivalent ot the binay number 10011.1 is

A. 19.5

B. 11001.11

C. 5005.55

D. 19.1

Answer:

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31. The binary represents of 60 is :

A. 111100

B. 101110

C. 110000

D. 110011

Answer:

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32. Which of the following statement is acontradiction $(p \wedge q) \wedge (\sim(p \vee q))$

A. $p \wedge q \Rightarrow p$

B. $\sim(p \wedge q) \vee p$

C. $(\sim p \wedge q) \cap (\sim p \vee p)$

D. $q \wedge \sim(p \wedge q)$

Answer:

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33. The period of $f(x) = \sin\left(\frac{\pi x}{n-1}\right) + \cos\left(\frac{\pi x}{n}\right), n \in Z, n > 2$, is

A. 2rnn-1

B. 4nn-1

C. 2nn-1

D. none of these

Answer:

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34. The radius of the circle whose arc of length 15 km makes an angle of $\frac{3}{4}$ radian at the centre ,is :

A. 20cm

B. 10cm

C. $22\frac{2}{2}cm$

D. $11\frac{1}{4}cm$

Answer:

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35. If $3^x + 2^{2x} \geq 5^x$, then the solution set for x, is

A. $-\infty, 2]$

B. $[2, \infty$

C. [2]

D. [0,2]

Answer:

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36. The number of integral solutions of $\frac{x+1}{x^2+2} > \frac{1}{4}$ is

A. 1

B. 2

C. 5

D. none of these

Answer:

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37. The value of k for which the equation $(k-2)x^2+8x+k+4=0$ has both roots real, distinct and negative, is

A. 0

B. 2

C. 3

D. -4

Answer:

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38. The triangle PQR of which the angles P,Q,R satisfy cos P $= \frac{\sin Q}{2 \sin R}$ is :

A. equilateral

B. right angled

C. any triangle

D. isosceles

Answer: D

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39. The function $f(x) = \left[x^2\right]$ (where $[y]$ is the greatest integer less than or equal to y), is discontinuous at a. all

integers b. all integers except 0 and 1 c. all integers except 0

d. all integers except 1

A. all integers

B. all integers except 0 and 1

C. all integers except 0

D. all integers except 1

Answer:

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40. A function f(x) $= \frac{x^2 - 3x + 2}{x^2 + 2x - 3}$ is

A. maximum at x = -3

B. maximum at x = -3 and maximum at x = 1

C. maximum at x = 1

D. function is increasing in its domain

Answer:

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41. The locus of the point $P(x, y)$ satisfying the relation $\sqrt{(x-3)^2+(y-1)^2}+\sqrt{(x+3)^2+(y-1)^2}=6$, is

A. straight line

B. pair of straight lines

C. circle

D. ellipse

Answer:

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42. If z_1, z_2 and z_3 are complex numbers such that $|z_1| = |z_2| = |z_3| = \left|\frac{1}{z_1} + \frac{1}{z_2} + \frac{1}{z_3}\right| = 1, then |z_1 + z_2 + z_3|$ is (A) equal to 1 (B) gt1 (C) gt3 (D) equal to 3

A. equal to 1

B. less than 1

C. greater than 3

D. equal to 3

Answer:

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43. If a_1, a_2, a_3 be any positive real numbers, then which of the following statement is not true.

A. $3a_1a_2a_3 \leq a_1^3 + a_2^3 + a_3^3$

B. $\frac{a_3}{a_2} + \frac{a_2}{a_3} + \frac{a_3}{a_1} \geq 3$

C. $a_1a_2a_3\left(\frac{1}{a_1} + \frac{1}{a_2} + \frac{1}{a_3}\right) \geq 9$

D. $a_1a_2a_3\left(\frac{1}{a_1} + \frac{1}{a_2} + \frac{1}{a_3}\right)^3 \leq 27$

Answer:

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44. If $ab = 2a + 3b, a > 0, b > 0$, then the minimum value of ab is

A. 12

B. 24

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

D. none of these

Answer:

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45. If $f(x) = \cos\left[\pi^2\right]x,$ where $[x]$ stands for the greatest integer function, then $f\left(\frac{\pi}{2}\right) = -1$ (b) $f(\pi) = 1$ $f(-\pi) = 0$ (d) $f\left(\frac{\pi}{4}\right) = 1$

A. $f\pi/4 = 2$

B. $f - \pi = 2$

C. $f\pi = 1$

D. $f\pi/2 = -1$

Answer:

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46. Let $f(x) = \frac{x^2 - 4}{x^2 + 4}$, for $|x| \geq 2$, then the function $f: (-\infty, -2] \cup [2, \infty) \to (-1, 1)$ is :

A. one-one into

B. one -one onto

C. many - onto into

D. many - one onto

Answer:

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47. The function $f(x) = \sin\left|\log\left(x + \sqrt{x^2 + 1}\right)\right|$ is :

A. even function

B. odd function

C. neither even nor odd

D. periodic function

Answer: B

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48. Find the range of $f(x) = \sec\left(\frac{\pi}{4}\cos^2 x\right)$, where `-oo

A. $[1, \sqrt{2}]$

B. $[1, \infty$

C. $[1, \sqrt{2}, -1] \cup [1, \sqrt{2}]$

D. $-\infty, 1] \cup [1, \infty$

Answer:

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49. For any three sets A_1, A_2, A_3. Let $B_1 = A_1, B_2 = A_2 - A_1$ and $B_3 = A_3 - A_1 \cup A_2$, then which of the following statement is always true ?

A. $A_1 \cup A_2 \cup A_3 \supset B_1 \cup B_2 \cup B_3$

B. $A_1 \cup A_2 \cup A_3 = B_1 \cup B_2 \cup B_3$

C. $A_1 \cup A_2 \cup A_3 \subset B_1 \cup B_2 \cup B_3$

D. none of these

Answer:

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50. the domain of the function $f(x) = \frac{\sin^{-1}(3-x)}{\log(x-2)}$ is :

A. $[2, 4]$

B. $(2, 3) \cup (3, 4]$

C. $[2, \infty$

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

Answer:

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51. Write the remainder obtained when 1! + 2! + 3! + ... + 200! is divided by 14

A. 3

B. 4

C. 5

D. none of these

Answer:

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