MATHS

BOOKS - IPUCET PREVIOUS YEAR PAPERS MATHS (HINGLISH)

GGSIPU MATHEMATICS 2014

Mcqs

1. $\lim_{x \to \infty} \sin x$ is equal to

A. 0

B. ∞

C. exists is finite and non-zero

D. Does not exist

Answer:

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2. If

$= a + b, y = a\omega + b\omega^2$ and $z = a\omega^2 + b\omega$,

prove tht `xyz=a^3+b^3

A. a + b

B. $a^2 + b^2$

C. $a^3 + b^3$

D. $a^4 + b^4$

Answer:

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3. $\lim_{n \to \infty} \left(\frac{2n^3}{2n^2 + 3} + \frac{1 - 5n^2}{5n + 1} \right)$ is equal to

A. 0

B. 1

C. 1/5

D. ∞

Answer:

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4. $\lim_{x \to \frac{\pi}{6}} \frac{\sin\left(x - \frac{\pi}{6}\right)}{\sqrt{3} - \cos x}$

A. 0

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

C. 1

D. ∞

Answer:

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5. $\lim_{x \to \infty} \left(\frac{2x^2+3}{2x^2+5} \right)^{8x^2+3}$ is equal to

A. 0

B. 1

C. e^8

D. e^{-8}

Answer:

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6. Find the slope of the normal to the curve $4x^3 + 6x^2 - 5xy - 8y^2 + 9x + 14 = 0$ at the point (-2, 3).

A. ∞

B. 11

C. $\frac{9}{2}$

D. $\frac{2}{9}$

Answer:

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7. The value of $\lim_{x \to 0} \frac{\sin 3x^2}{\ln \cos(2x^2 - x)}$ is

A. 0

B. -6

C. 1

D. ∞

Answer:

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8. $\int_{-\pi/2}^{\pi/2} \cos x \ln\left(\frac{1+x}{1-x}\right) dx$ is equal to

A. 0

B. $\frac{\pi^2}{4}\left(-1+\frac{\pi}{2}\right)$

C. 1

D. $\frac{\pi^2}{2}$

Answer:

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9. $\lim_{n \to \infty} \left(\frac{\sqrt[3]{n!}}{n} \right)$ is equal to

A. 0

B. 1

C. -1

D. e^{-1}

Answer:

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10. $\int_0^{\pi} \frac{\sqrt{1+\cos 2x}}{2} dx$

A. 0

B. 2

C. 4

D. -2

Answer:

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11. The quadrangle with the vertices $A(3, 5, 6), B(1, -5, 7), C(8, -3, -1)$, and D$(4, 7, -2)$ is a

A. square

B. rectange

C. parallelelogram

D. trapezoid

Answer:

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12. In the triangle with vertices A(1, -1, 2), B(5, -6, 2) and C(1, 3, -1), find the altitude n = |BD|.

A. 5

B. 10

C. $5\sqrt{2}$

D. $\frac{10}{\sqrt{2}}$

Answer:

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13. If $\frac{1}{b-a}+\frac{1}{b-c}=\frac{1}{a}+\frac{1}{c}$, then a,b and c are in

A. AP

B. HP

C. GP

D. Both b and c

Answer:

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14. Compute the shortest distance between the circle $x^2 + y^2 - 10x - 14y - 151 = 0$ and the point $(-7, 2)$.

A. 0

B. 1

C. 2

D. 4

Answer:

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15. On the ellipse $9x^2 + 25y^2 = 225$, find the point whose distance to the focus F_1 is four times the distance to the other focus F_2

A. $(-15, \sqrt{63})$

B. $\left(\frac{-15}{4}, \frac{\sqrt{63}}{2}\right)$

C. $\left(\frac{-15}{4}, \frac{\sqrt{63}}{4}\right)$

D. $\left(\frac{-15}{2}, \frac{\sqrt{63}}{2}\right)$

Answer:

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16. On the parabola $y^2 = 64x$, find the point nearest to the straight line 4x + 3y - 14 = 0.

A. $-24, 9$

B. 9, 12

C. $-9, 24$

D. $9, -24$

Answer:

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17. The determinant $\begin{bmatrix} x & y & x+y \\ y & x+y & x \\ x+y & x & y \end{bmatrix}$ is divisible by

A. x-y

B. $x^2 - y^2 + xy$

C. $x^2 + xy + y^2$

D. $x^2 - xy + y^2$

Answer:

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18. The curve $5x^2 + 12xy - 22x - 12y - 19 = 0$ is.

A. ellipse

B. parabola

C. hyperbola

D. parallel straight lines

Answer:

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19. The derivative of $y = x^{2^x}$ w.r.t. x is

A. $x^{2^x} 2^x \left(\frac{1}{x} + \ln x \ln 2 \right)$

B. $x^{2^x} \left(\frac{1}{x} + \ln x \ln 2 \right)$

C. $x^{2^x} 2^x \left(\frac{1}{x} + \ln x \right)$

D. $x^{2^x} 2^x \left(\frac{1}{x} + \frac{\ln x}{\ln 2} \right)$

Answer:

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20. $\lim_{x \to \frac{\pi}{2}} (\pi - 2x)^{\cos x}$ is equal to

A. 0

B. 1

C. e

D. e^{-1}

Answer:

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21. Evaluate the following :

$$\int_0^1 x \tan^{-1} x dx$$

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

B. $\frac{\pi}{4} + \frac{1}{2}$

C. $\frac{\pi}{4} - \frac{1}{2}$

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

Answer:

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22. $\int_0^{\pi/3} \frac{\cos\theta}{5-4\sin\theta} d\theta$ equal to

A. $\frac{1}{4}\log\left(\frac{5}{5+2\sqrt{3}}\right)$

B. $\frac{1}{4}\log\left(\frac{5}{5-2\sqrt{3}}\right)$

C. $\frac{1}{4}\log\left(\frac{5+2\sqrt{3}}{5}\right)$

D. $\frac{1}{4}\log\left(\frac{5-2\sqrt{3}}{5}\right)$

Answer:

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23. $\int \frac{xdx}{(1+x)^{3/2}}$ is equal to

A. $2\frac{(2+x)}{\sqrt{1+x}}+c$

B. $\frac{\sqrt{(2+x)}}{\sqrt{1+x}}+C$

C. $\frac{3}{2}\frac{x}{\sqrt{1+x}}+C$

D. $\frac{3}{2}\frac{(2+x)}{\sqrt{1+x}}+C$

Answer:

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24. $\int a^x \, dx$ is equal to

A. $\frac{a^x}{x \log a} + C$

B. $a^x \log a + C$

C. $\frac{a^x}{\log a} + C$

D. $\frac{x a^x}{\log a} + C$

Answer:

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25. $\int_{-ip}^{\pi} [\cos px - \sin qx]^2$ dx where p,q are integers is equal to

A. $-\pi$

B. 0

C. π

D. 2π

Answer:

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26. The solution of the differential equation $x^2 - y^2 dx + 2xydy = 0$, is

A. $x^2 - y^2 = Cx$

B. $x^2 - y^2 = Cy$

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

D. $x^2 - y^2 = Cy$

Answer:

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27. The solution of the differential equation $\frac{d^2y}{dx^2} + 3y = -2x$ is

A. $c_1 \cos\sqrt{3x} + c_2 \sin\sqrt{3x} - \frac{2}{3}x$

B. $c_1 \cos\sqrt{3x} + c_2 \sin\sqrt{3x} - \frac{4}{5}$

C. $c_1 \cos\sqrt{3x} + c_2 \sin\sqrt{3x} - 2x^2 + \frac{4}{9}$

D. $c_1 \cos\sqrt{3x} + c_2 \sin\sqrt{3x} - \frac{2}{3}x^2 + \frac{4}{9}$

Answer:

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28. Angles A, B, C of a δABC are in AP and $b: c = \sqrt{3}: \sqrt{2}$, then $\angle A$ is given by

A. 45°

B. 60°

C. 75°

D. 90°

Answer:

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29. The angle between the vectors $a = \hat{i} + 2\hat{j} + 2\hat{k}$ and $b = \hat{i} - 2\hat{j} + 2\hat{k}$ is

A. $\sin^{-1} 1/9$

B. $\cos^{-1} 8/9$

C. $\sin^{-1}(8/9)$

D. $\cos^{-1}(1/9)$

Answer:

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30. The straight line $r = \hat{i} - \hat{j} + \hat{k} + \lambda\left(2\hat{i} + \hat{j} - \hat{k}\right)$ are

A. perpendicular to each other

B. parallel

C. inclined at an angle 60°

D. inclined at an angle 45°

Answer:

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31. If two cards are drawn simultaneously from the same set, then probability that atleast one of them will be the ace of hearts is

A. $\frac{1}{13}$

B. $\frac{1}{26}$

C. $\frac{1}{52}$

D. $\frac{3}{13}$

Answer:

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32. In a class, there are 10 boys and 8 girls. When 3 students are selected at random, the probability that 2 girls and 1 boy are selected, is

A. $\frac{35}{102}$

B. $\frac{15}{102}$

C. $\frac{55}{102}$

D. $\frac{25}{102}$

Answer:

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33. If M and N are any two events, the probability that exactly one of them occurs is (for an event set A, the complement is A°)

A. $P(M) + P(N) - 2P(M \cup N)$

B. $P(M) + P(N) - P(M \cup N)$

C. $P(M^\circ) + P(N^\circ) - 2P(M^\circ \cup N^\circ)$

D. $P(M \cup N^\circ) + P(M^\circ \cup N)$

Answer:

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34. If three square are chosen at random on a chess Board, show that chance that they should be in a diagonal line 7/744.

A. $\frac{7}{744}$

B. $\frac{5}{744}$

C. $\frac{7}{544}$

D. $\frac{11}{744}$

Answer:

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35. if $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$, show that $A^2 - 5A + 7I = 0$.

A. $A^2 + 7A - 5/ = 0$

B. $A^2 - 7A + 5/ = 0$

C. $A^2 + 5A - 7/ = 0$

D. $A^2 - 5A + 7/ = 0$

Answer:

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36. $\int_0^1 \frac{dx}{1+x+x^2}$

A. $\frac{\pi}{\sqrt{3}}$

B. $\frac{\pi}{2\sqrt{3}}$

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

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

Answer:

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37. A market researchgroup conducted a survey of 1000 consumers and reported that 720 consumers like product A and 450 consumers like product B. Then, the least number of consumers that must have liked both the products is

A. 170

B. 180

C. 210

D. 190

Answer:

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38. Find the equation of the plane through the points (2,2,1) and (9,3,6) and $perpendicar \rightarrow thepla \neq$ 2x+6y+6z=1`

A. $2x - 4y + 5z - 9 = 0$

B. $3x + 4y - z - 5 = 0$

C. $3x + 4y - 5z - 9 = 0$

D. $x + 4y - 9z - 3 = 0$

Answer:

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39. Find the regression coefficient b_{yx} and b_{xy} and the two lines of regression for the following data. Also compute the correlation coefficient

A. $y + 0.4x = 1$

B. $y + 0.5x = 5$

C. $y + 0.4x = 7$

D. $y + 1.4x = 7$

Answer:

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40. The measure of the chord intercepted by circle $x^2 + y^2 = 9$ and the line x-y+2= 0 is

A. $\sqrt{28}$

B. $2\sqrt{5}$

C. 7

D. 5

Answer:

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41. Find the value of $\tan^{-1}\sqrt{3} - \cot^{-1} - \sqrt{3}$

A. 0

B. $2\sqrt{3}$

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

D. π

Answer:

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42. Show that the sum of deviations of the values of the variable from their arithmetic mean is equal to zero.

A. $+1$

B. 0

C. -1

D. real number

Answer:

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43. If a single letter is selected at random from the word 'PROBABILITY', then the probability that it is a vowel is

A. $\frac{8}{11}$

B. $\frac{4}{11}$

C. $\frac{2}{11}$

D. $\frac{3}{11}$

Answer:

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44. An object is observed from three points A, B, C in the same horizontal line passing through the base of the object. The angle of elevation at B is twice and at C thrice that at A. If $AB = a, BC = b$ prove that the height of the object is $\frac{a}{2b}\sqrt{(a+b)(3b-a)}$

A. $\frac{a}{2b}\sqrt{(a+b)(3b-a)}$

B. $\frac{a}{2b}\sqrt{(a-b)(3b-a)}$

C. $\frac{a}{2b}\sqrt{(a-b)(3b+a)}$

D. $\frac{a}{2b}\sqrt{(a+b)(3b+a)}$

Answer:

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45. The angle between the lines whose direction ratios are $1, 1, 2, \sqrt{3}-1, -\sqrt{3}-1, 4$ is

A. $\cos^{-1}\left(\frac{1}{65}\right)$

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

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

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

Answer:

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