MATHS

BOOKS - IPUCET PREVIOUS YEAR PAPERS MATHS (HINGLISH)

GGSIPU MATHMATICS 2012

Mcqs

1. If the lines $x - y - 1 = 0, 4x + 3y = k$ and $2x - 3y + 1 = 0$ are concurrent, then k is

A. 1

B. -1

C. 25

D. 5

Answer:

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2. Circles $x^2 + y^2 = 4$ and $x^2 + y^2 - 2x - 4y + 3 = 0$

A. 1

B. 2

C. 3

D. 4

Answer:

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3. The centroid of a triangle formed by the points $(0, 0), (\cos\theta, \sin\theta)$ and $(\sin\theta, -\cos\theta)$ lie on the line $y = 2x$, then θ is

A. $\tan^{-1} 2$

B. $\tan^{-1}\left(\frac{1}{3}\right)$

C. $\tan^{-1}\left(\frac{1}{2}\right)$

D. $\tan^{-1} - 3$

Answer:

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4. The orthocentre of the triangle formed by $(8, 0)$ and $(4, 6)$ with the origin, is

A. $\left(4, \frac{8}{3}\right)$

B. 3 , -4

C. 4 , 3

D. 3 , 4

Answer:

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5. If the angle between the two lines represented by $2x^2 + 5xy + 3y^2 + 6x + 7y + 4 = 0$ is $\tan^{-1}(m)$, then m is equal to

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

B. 1

C. $\frac{7}{5}$

D. 7

Answer:

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6. If $xy - 4x + 3y - \lambda = 0$ represents the asymptotes of $xy - 4x + 3y = 0$, then λ is

A. 3

B. -6

C. 8

D. 12

Answer:

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7. Equation of the chord of the parabola $y^2 = 8x$ which is bisected at the point $(2, -3)$ is

A. 4x+3y+1 = 0

B. 3x+4y -1 = 0

C. 4x -3y-1 = 0

D. 3x -4y+1 =0

Answer:

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8. If x+y+1 = 0 touches the parabola $y^2 = \lambda x$, then λ is equal to

A. 2

B. 4

C. 6

D. 8

Answer:

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9. The equation $x = \frac{e^t + e^{-t}}{2}, y = \frac{e^t - e^{-t}}{2}, t \in R,$ represents

A. an ellipse

B. a parabola

C. a hyperbola

D. a circle

Answer:

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10. If e_1 and e_2 are the eccentricities of two conics with $e_1^2 + e_2^2 = 3$, then the conics are

A. ellipses

B. parabolas

C. circles

D. hyperbolas

Answer:

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11. The sum of the distances of any point on the ellipse $3x^2 + 4y^2 = 24$ from its foci , is

A. $8\sqrt{2}$

B. 8

C. $16\sqrt{2}$

D. $4\sqrt{2}$

Answer:

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12. In ΔABC , if a tends to 2c and b tends to 3 c , then $\cos B$ tends to

A. -1

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

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

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

Answer:

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13. If $\sin(\pi\cos\theta) = \cos(\pi\sin\theta)$, then which one fo the following is correct?

A. $\cos\theta = \frac{3}{2\sqrt{2}}$

B. $\cos\left(\theta - \frac{\pi}{2}\right) = \frac{1}{2\sqrt{2}}$

C. $\cos\left(\theta - \frac{\pi}{4}\right) = \frac{1}{2\sqrt{2}}$

D. $\cos\left(\theta + \frac{\pi}{4}\right) = -\frac{1}{2\sqrt{2}}$

Answer:

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14. $\sin 12^\circ \sin 48^\circ \sin 54^\circ$ is equal to

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

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

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

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

Answer:

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15. If:

$$3\sin^{-1}\left(\frac{2x}{1+x^2}\right) - 4\cos^{-1}\left(\frac{1-x^2}{1+x^2}\right) + 2\tan^{-1}\left(\frac{2x}{1-x^2}\right) = \frac{\pi}{3}$$

, where $|x| < 1$, then: x=

A. $\frac{1}{\sqrt{3}}$

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

C. $\sqrt{3}$

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

Answer:

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16. The angle of elevation of the sun when the length of the shadow of a pole is $\sqrt{3}$ times the height of the pole is

A. 40°

B. $\frac{45^\circ}{2}$

C. 60°

D. 30°

Answer:

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17. The point of contact of the line $x - y + 2 = 0$ with the parabola $y^2 - 8x = 0$ is

A. $2, 4$

B. $-2, 4$

C. $2, -4$

D. $2, 2$

Answer:

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18. The sides of a triangle are $x^2 + x + 1, 2x + 1, and x^2 - 1$.

Prove that the greatest angle is 120^0.

A. 90°

B. 135°

C. 115°

D. 120°

Answer:

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19. $\cos 1^\circ . \cos 2^\circ . \cos 3^\circ \ldots . \cos 179^\circ =$

A. $\frac{1}{\sqrt{2}}$

B. 0

C. 1

D. -1

Answer:

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20. If $\cot(\alpha+\beta)=0$, then $\sin(\alpha+2\beta)$=

A. $\sin\alpha$

B. $\cos\alpha$

C. $\sin\beta$

D. $\cos 2\beta$

Answer:

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21. The value of $4\sin A\cos^3 A - 4\cos A\sin^3 A$ is equal to

A. cos 2 A

B. sin 3 A

C. sin 2A

D. sin 4A

Answer:

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22. If the solutions for θ of $\cos p\theta + \cos q\theta = 0, p > q > 0$ are in A.P, then numerically smallest common differece of A.P is

A. $\frac{\pi}{p+q}$

B. $\frac{2\pi}{p+q}$

C. $\frac{\pi}{2(p+q)}$

D. $\frac{1}{p+q}$

Answer: B

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23. The value of k, for which

$(\cos x + \sin x)^2 + k \sin x \cos x - 1 = 0$ is an identity, is

A. -1

B. -2

C. 0

D. 1

Answer:

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24. If $4\cos^{-1}x + \sin^{-1}x = \pi$, then the value of x is

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

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

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

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

Answer:

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25. A problem in mathematics is given to 3 students whose chances of solving it are $\frac{1}{2}; \frac{1}{3}; \frac{1}{4}$. What is the probability that the problem is solved?

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

B. $\frac{1}{24}$

C. $\frac{23}{24}$

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

Answer:

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26. In a non leap year the probability of getting 53 Sundays or 53 Tuesdays or 53 Thursdays

A. $\frac{1}{7}$

B. $\frac{2}{7}$

C. $\frac{3}{7}$

D. $\frac{4}{7}$

Answer:

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27. The probability for arandomly chosen month to have its 10^{th} day as Sunday , is

A. $\frac{1}{84}$

B. $\frac{10}{12}$

C. $\frac{10}{84}$

D. $\frac{1}{7}$

Answer:

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28. If the mean of the numbers $27+x, 31+x, 89+x, 107+x, 156+x$ is 82, then the mean of $130+x, 126+x, 68+x, 50+x, 1+x$ is

A. 79

B. 157

C. 82

D. 75

Answer:

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29. If $\overline{X}$ is the mean of a distribution of X, then under usual notation sum $\sum_{i=1}^{n} f_i(x_2 - \bar{x})$ is

A. MD

B. SD

C. 0

D. relative frequency

Answer:

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30. Two cards are drawn successively with replacement from a well-shuffled pack of 52 cards. The probability of drawing two aces is

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

B. $\frac{1}{13} \times \frac{1}{17}$

C. $\frac{1}{52} \times \frac{1}{51}$

D. $\frac{1}{13} \times \frac{1}{13}$

Answer:

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31. If $\sec\left(\frac{x+y}{x-y}\right) = a$, prove that $\frac{dy}{dx} = \frac{y}{x}$.

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

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

C. y

D. x

Answer:

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32. If $x^y = e^{x-y}$, then $\frac{dy}{dx}$ is equal to

A. $\frac{\log x}{1+\log x}$

B. $\frac{\log x}{1-\log x}$

C. $\frac{\log x}{1+\log x^2}$

D. $\frac{y\log x}{x(1+\log x)}$

Answer:

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33. For $y = \cos\left(m\sin^{-1}x\right)$, which of the following is true?

A. $1 - x^2y + xy_1 - m^2y = 0$

B. $1 - x^2y_2 - xy_1 + m^2y = 0$

C. $1 + x^2y_2 + xy_1 - m^2y = 0$

D. $\left(- x^2 \right)y_2 + xy_1 + m^2y = 0$

Answer:

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34. If $f(x) = \begin{cases} x + 1 & x \leq 1 \\ 3 - ax^2 & x > 1 \end{cases}$ is continuous at x =1, then the value of a is

A. -1

B. 2

C. -3

D. 1

Answer:

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35. $\lim_{x \to \frac{\pi}{2}} \frac{a^{\cot x} - a^{\cos x}}{\cot x - \cot x}$ is equalt o

A. log a

B. log 2

C. a

D. log x

Answer:

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36. If $f''(0) = k, k \neq 0,$ then the value of $\lim_{x \to 0} \frac{2f(x) - 3f(2x) + f(4x)}{x^2}$ is

A. k

B. 2k

C. 3k

D. 4k

Answer:

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37. If g is the inversefunction of f and f' (x) = $\frac{1}{1 + x^n}$ then g'(x) is equal to

A. $1 + gx^n$

B. $1 - gx$

C. $1 + gx$

D. $1 - gx^n$

Answer:

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38. The curves $4x^2 + 9y^2 = 72$ and $x^2 - y^2 = 5at(3, 2)$ touch each other (b) cut orthogonally intersect at 45^0 (d) intersect at 60^0

A. touch each other

B. cut orthogonally

C. interest at 45°

D. interest at 60°

Answer:

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39. The velocity in m/s of a particle is proportional to the cube of the time. If the velocity after 2 s is 4m/s, then v is equal to

A. t^3

B. $\frac{t^3}{2}$

C. $\frac{t^3}{3}$

D. $\frac{t^3}{4}$

Answer:

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40. The minimum value of $x\,(\log)_e x$ is equal to e (b) $1/e$ (c) $-1/e$ (d) $2e$ (e) e

A. e

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

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

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

Answer:

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41. A particle moves along the x-axis so that its position is given $x = 2t^3 - 3t^2$ at a time t second. What is the time interval duringwhich particle will be on the negative half of the axis?

A. $0 < t < \frac{2}{3}$

B. $0 < 1$

C. $0 < t < \frac{3}{2}$

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

Answer:

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42. A stone thrown vertically upwards satisfies the equations s = $80t - 16t^2$. The time required to reach the maximum height is

A. 2 s

B. 4s

C. 3 s

D. 2.5 s

Answer:

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43. If f (x+ y) = f(x) , f(y) , f(3) = 3 , f'(0) = 11 . Then f'(3) is equal to

A. $11. e^{33}$

B. 33

C. 11

D. g^{33}

Answer:

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44. If y = x tan y , then $\frac{dy}{dx}$ is equal to

A. $\frac{x \tan y}{x + x^2 - y^2}$

B. $\frac{y}{x - x^2 - y^2}$

C. $\frac{\tan y}{y - x}$

D. $\frac{\tan x}{x - y^2}$

Answer:

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45. The product of the lengths ofsubtangent and subnormal at any point x,y of a curve is

A. x^2

B. y^2

C. a constant

D. x

Answer:

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46. The equation to the tangent to $\left(\frac{x}{a}\right)^n + \left(\frac{y}{b}\right)^n = 2$ at (a, b)

A. $\frac{x}{a} + \frac{y}{b} = 2$

B. $\frac{x}{a} + \frac{y}{b} = 1$

C. $\frac{x}{b} + \frac{y}{a} = 2$

D. $ax + by = 2$

Answer:

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47. The value of $\int_0^\infty \frac{dx}{(x^2+4)(x^2+9)}$ is

A. $\frac{\pi}{60}$

B. $\frac{\pi}{20}$

C. $\frac{\pi}{40}$

D. $\frac{\pi}{80}$

Answer:

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48. $\int e^{a\log x} + e^{x\log a}$ dx is equal to

A. $\frac{x^{a+1}}{a+1} + C$

B. $\frac{x^{a+1}}{a+1} + \frac{a^x}{\log a} + C$

C. $x^{a+1} + a^x + c$

D. $\frac{x^{a+1}}{a-1} + \frac{\log a}{a^x} + C$

Answer:

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49. $\int_0^a \frac{dx}{x+\sqrt{a^2-x^2}}$

A. $\frac{a^2}{4}$

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

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

D. π

Answer:

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50. If $\int_{-1}^{4} f(x)dx = 4$ and $\int_{2}^{4} (3 - f(x))dx = 7$, then $\int_{-1}^{2} f(x)dx =$

A. -2

B. 3

C. 5

D. 8

Answer:

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