MATHS

BOOKS - IPUCET PREVIOUS YEAR PAPERS MATHS (HINGLISH)

GGSIPU MATHEMATICS 2007

Mcq

1. If $(p \wedge \sim r) \rightarrow (\sim p \vee q)$ is false, then truth values of p,q and r are respectively.

A. T,F and F

B. F,F and T

C. F,T and T

D. T,F and T

Answer:

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2. If α, β and γ are the roots of equation $x^3 - 8x + 8 = 0$, then $\sum \alpha^2$ and $\sum \frac{1}{\alpha\beta}$ are respectively

A. 0 and - 16

B. 16 and 8

C. -16 and 0

D. 16 and 0

Answer:

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3. The GCD of 1080 and 675 is

A. 145

B. 135

C. 225

D. 125

Answer:

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4. x = 4 (1+cos θ) and y=3 (1+sin θ) are the paramatic equations of

A. $\frac{(x-3)^2}{9}+\frac{(y-4)^2}{16}=1$

B. $\frac{(x+4)^2}{16}+\frac{(y+3)^2}{9}=1$

C. $\frac{(x-4)^2}{16}-\frac{(y-3)^2}{9}=1$

D. $\frac{(x-4)^2}{16}+\frac{(y-3)^2}{9}=1$

Answer: D

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5. If the distance between the foci and the distance between the directrices of the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ are in the ratio 3:2,then a:b is

A. $\sqrt{2} : 1$

B. $\sqrt{3} : \sqrt{2}$

C. $1 : 2$

D. 2

Answer:

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6. The ellipse $\frac{x^2}{25} + \frac{y^2}{16} = 1$ and the hyperbola $\frac{x^2}{25} - \frac{y^2}{16} = 1$ have in common

A. centre only

B. centre,foci and directrices

C. centre,foci and vertices

D. centre and vertices only

Answer:

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7. If $\sec\theta = m, \tan\theta = n$, then $\frac{1}{m}\left\{(m+n)+\frac{1}{m+n}\right\}$

A. 2

B. 2m

C. 2n

D. m

Answer:

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8. The value of $\frac{\sin 85^\circ - \sin 35^\circ}{\cos 65^\circ}$ is

A. 2

B. -1

C. 1

D. 0

Answer:

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9. If the length of the tengent from any point on the circle $x-3^2+y+2^2=5r^2$ to the circle $x-3^2+y+2^2=r^2$ is 16 unit,then the area between the two circles in sq unit is

A. 32π

B. 4π

C. 8π

D. 256π

Answer:

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10. The equation of the common tangentof the two touching circles $y^2 + x^2 - 3x - 8y + 22 = 0$ and $x^2 + y^2 - 5y + 7 = 0$ is

A. x +y - 5 = 0

B. x - y + 5= 0

C. x - y - 5 =0

D. x + y + 5 = 0

Answer:

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11. The equation of the parabolas with vertex at -1,1 and focus 2,1 is

A. $y^2 - 2y - 12x = 11 = 0$

B. $x^2 + 2x - 12y + 13 = 0$

C. $y^2 - 2y + 12x + 11 = 0$

D. $y^2 - 2y - 12x + 13 = 0$

Answer:

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12. The equation(s) of the line(s) which touch both the circle $x^2 + y^2 = 5$ and the parabola $y^2 = 40x$ is

A. $2x - y \pm 5 = 0$

B. $2x - y + 5 = 0$

C. $2x - y - 5 = 0$

D. $2x + 5y - 5 = 0$

Answer:

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13. If $2A+3B=\begin{bmatrix}2 & -1 & 4\\ 3 & 2 & 5\end{bmatrix}$ and $A+2B=\begin{bmatrix}5 & 0 & 3\\ 1 & 6 & 2\end{bmatrix}$, then B is

A. $\begin{bmatrix}8 & -1 & 2\\ -1 & 10 & -1\end{bmatrix}$

B. $\begin{bmatrix}8 & 1 & 2\\ -1 & 10 & -1\end{bmatrix}$

C. $\begin{bmatrix}8 & 1 & 2\\ -1 & 10 & -1\end{bmatrix}$

D. $\begin{bmatrix}8 & 1 & 2\\ 1 & 10 & 1\end{bmatrix}$

Answer:

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14. If $A=\begin{bmatrix}1 & -3\\ 2 & k\end{bmatrix}$ and $A^2-4A+10I=A$, then k is equal to

A. 0

B. -4

C. 4

D. none of these

Answer:

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15. The value of $\begin{vmatrix} x+y & y+z & z+x \\ x & y & z \\ x-y & y-z & z-x \end{vmatrix}$ is euqal to

A. 2x+y+z

B. 2x+y-z

C. x+y+z

D. 0

Answer:

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16. On the set $\mathbb{Q}$ of all rational number the operation $*$ which is both associative and commutative is given by $a * b =$

A. a+b+ab

B. $a^2 + b^2$

C. $ab + 1$

D. $2a + 3b$

Answer:

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17. From an aeroplaneflying,vertically above a horizontal road,the angles of depression of two consecutive stones on the same side of aeroplane are observed to be 30° and 60° respectively.The height at which the aeroplane is flying in km is

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

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

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

D. 2

Answer:

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18. If the angles of a triangle are in the ratio 3:4:5,then the sides are in the ratio

A. $\sqrt{6}: \sqrt{3}+1$

B. $\sqrt{2}: \sqrt{6}: \sqrt{3}+1$

C. $2: \sqrt{3}: \sqrt{3}+1$

D. $3: 4: 6$

Answer:

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19. If $\cos^{-1}(x) = \alpha, (0 < x < 1)$ and $\sin^{-1}\left(2x\sqrt{1-x^2}\right) + \sec^{-1}\left(\frac{1}{2x^2-1}\right)$

, than $\tan^{-1}$(2x) equals

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

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

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

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

Answer:

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20. If a > b > 0,than the value of $\tan^{-1}\left(\frac{a}{b}\right) + \tan^{-1}\left(\frac{a+b}{a-b}\right)$ depends on

A. both a and b

B. b and not a

C. a and not b

D. neither a nor b

Answer:

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21. If $A=\{a, b, c\}, B=\{b, c, d\}$ and

$C=\{a, d, c\},$ then $(A-B)\times(B\cap C)=$

A. {a,c , a,d}

B. {a,b , c,d}

C. {c,a , d,a}

D. {a,c , a,d ,b,d}

Answer:

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22. The function $f: X \to Y$ defined by $f(x) = \sin x$ is one-one butnot onto if X and Y are respectively equal to

A. R and R

B. $[0, \pi]$ and $[0, 1]$

C. $\left[0, 1, \frac{\pi}{2}\right]$ and $[-1, 1]$

D. $\left[\frac{-\pi}{2}, \frac{\pi}{2}\right]$ and$[-1, 1]$

Answer:

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23. If $\log_4 2 + \log_4 4 + \log_4 16 + \log_4 x = 6$, then x =

A. 64

B. 4

C. 8

D. 32

Answer:

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24. If $S_n = \frac{1}{6.11} + \frac{1}{11.16} + \frac{1}{16.21} + \ldots.$ to n terms then $6S_n$ equals

A. $\frac{5n-4}{5n+6}$

B. $\frac{n}{5n+6}$

C. $\frac{2n-1}{5n+6}$

D. $\frac{1}{5n+6}$

Answer:

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25. The remainder obtained when $1!^2 + 2!^2 + 3!^2 + \ldots. + 100!^2$ is divided by 10^2 is

A. 27

B. 28

C. 17

D. 14

Answer:

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26. Find the inverse of 5 under multiplication modulo 11 on Z_{11} .

A. 5

B. 1

C. 7

D. 11

Answer:

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27. If $\overrightarrow{p} = \hat{i} + \hat{j}, \overrightarrow{q} = 4\hat{k} - \hat{j}$ and $\overrightarrow{r} = \hat{i} + \hat{k}$, then the unit vector in the direction of $3\overrightarrow{p} + \overrightarrow{q} - 2\overrightarrow{r}$ is

A. $\frac{1}{3}\left(\hat{i} + 2\hat{j} + 2\hat{k}\right)$

B. $\frac{1}{3}\left(\hat{i} - 2\hat{j} - 2\hat{k}\right)$

C. $\frac{1}{3}\left(\hat{i} - 2\hat{j} + 3\hat{k}\right)$

D. $\hat{i} + 2\hat{j} + 2\hat{k}$

Answer:

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28. If $\overrightarrow{a}$ and $\overrightarrow{v}$ are the two vectors such that $\left|\overrightarrow{a}\right| = 3\sqrt{3}, \left|\overrightarrow{b}\right| = 4$ and $\left|\overrightarrow{a} + \overrightarrow{b}\right| = \sqrt{7}$, then the anlge between $\overrightarrow{a}$

and $\vec{b}$ is

A. 120°

B. 60°

C. 30°

D. 150°

Answer:

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29. If $\vec{a}$ is vector perpendicular to both $\vec{b}$ and $\vec{c}$ then

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

B. $\vec{a} x \times \vec{b} + \vec{c} = 0$

C. $\vec{a} \times \overrightarrow{\times} \vec{c} = 0$

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

Answer:

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30. If the area of the parallelogram with $\vec{a}$ and $\vec{b}$ as two adjacent sides is 15 sq unit ,than the area of the parallelogram having, $3\vec{a}+2\vec{b}$ and $\vec{a}+3\vec{b}$ as two adjacent sides in sq unit is

A. 120

B. 105

C. 75

D. 45

Answer:

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31. If the lines x +3y-9=0,4x +by-2=0 and 2x -y-4=0 are concurrent , the b is equal to

A. -5

B. 5

C. 1

D. 0

Answer:

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32. The equation of the circle having x-y-2=0 and x-y+2=0 as two langents and x-y=0 as diameter, is

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

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

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

D. $x^2+y^2=1$

Answer:

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33. $\int \frac{x^3+3x^2+3x+1}{(x+1)^5}dx =$

A. $-\frac{1}{x+1}+c$

B. $\frac{1}{5}\log x+1+c$

C. $\log x+1+c$

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

Answer:

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34. $\int \frac{\text{cosec x}}{\cos^2\left(1+\log\tan.\ \frac{x}{2}\right)}dx$ is equal to

A. $\sin^2\left[1+\frac{\log\tan x}{2}\right]+c$

B. $\tan\left[1+\frac{\log\tan x}{2}\right]+c$

C. $\sec^2\left[1+\frac{\log\tan x}{2}\right]+c$

D. $\tan\left[1+\frac{\log\tan x}{2}\right]+c$

Answer:

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35. The complex number, $z=\frac{\left(-\sqrt{3}+3i\right)(1-i)}{\left(3+\sqrt{3}i\right)(i)\left(\sqrt{3}+\sqrt{3}i\right)}$

A. in the second quadrant

B. in the first quadrant

C. on the y -axis imaginary axis

D. on the x -axis real axis

Answer:

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36. If $2x = -1 + \sqrt{3}i$, then the value of $(1 - x^2 + x)^6 - (1 - x + x^2)^6$ is 32 (b) -64 (c) 64 (d) 0

A. 32

B. -64

C. 64

D. 0

Answer:

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37. The modulus and amplitude of $(1 + i\sqrt{3})^8$ are respectively

A. 256 and $\frac{\pi}{3}$

B. 256 and $\frac{2\pi}{3}$

C. 256 and $\frac{2\pi}{3}$

D. 256 and $\frac{8\pi}{3}$

Answer:

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38. The value of $\lim_{x \to 0} \frac{5^x - 5^{-x}}{2x}$ is

A. log5

B. 0

C. 1

D. 2log 5

Answer:

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39. Which one of the following isnot true always?

A. if f(x) is not continuous at x=a,then it is not differentiable at x=a

B. If fx is continuous at x= a,then it is differentiable at x=a

C. If f(x) and gx are differentiable at x=a,then f(x +gx)is also differentiable at x=a

D. If a function f(x is continuous at x=a,then $\lim_{x \to a} f(x)$ exists

Answer:

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40. $\int \frac{dx}{x\sqrt{x^6 - 16}} =$

A. $\frac{1}{3}\sec^{-1}\left(\frac{x^3}{4}\right) + c$

B. $\cos h^{-1}\left(\frac{x^3}{4}\right) + c$

C. $\frac{1}{12}\sec^{-1}\left(\frac{x^3}{4}\right) + c$

D. $\sec^{-1}\left(\frac{x^3}{4}\right) + c$

Answer:

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41. If $I_1 = \int_0^{\pi/2} x \sin x dx$ and $I_2 = \int_0^{\pi/2} x \cos x dx$,then which one of the following is true ?

A. $I_1 + I_2 = \frac{\pi}{2}$

B. $I_1 - I_2 = \frac{\pi}{2}$

C. $I_1 + I_2 = 0$

D. $I_1 = I_2$

Answer:

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42. If f(x) is defined on $[-2, 2]$ by $f(x) = 4x^2 - 3x + 1$ and $g(x) = \frac{f(-x) - f(x)}{x^2 + 3}$ then $\int_{-2}^{2} g(x) dx$ is equal to

A. 64

B. -48

C. 0

D. 24

Answer:

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43. The area enclosed between the parabola $y = x^2 - x + 2$ and the line y = x + 2 (in sq unit) equals to

A. $\frac{8}{3}$

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

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

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

Answer:

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44. The solution of the differential equation $e^{-x}(y+1)dy+\left(\cos^2 x-\sin 2x\right)y(dx)=0$ subjected to the condition that y = 1 when x = 0 is

A. $y+\log y+e^x\cos^2 x=c$

B. $\log y+1+e^x\cos^2 x=1$

C. $y+\log y=e^x\cos^2 x$

D. $y+1+e^x\cos^2 x=2$

Answer:

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45. If the curve $y=2x^3+ax^2+bx+c$ passes through the origin and the tengents drawn to it at x= -1 and x=2 are parallel to the x axis,then the values of a,b and c are respectively

A. 12, -3 and 0

B. -3,-12 and 0

C. -3,12 and 0

D. 3, -12 and 0

Answer:

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46. The locus of the point which moves such that the ratio of its distance from two fixed point in the plane is always a constant $k(< 1)$ is

A. hyperbola

B. ellipse

C. straight line

D. circle

Answer:

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47. The circles $ax^2 + ay^2 + 2g_1x + 2f_1y + c_1 = 0$ and $bx_2 + by^2 + 2g_2x + 2f_2y + c_2 = 0a \neq 0$ and $b \neq 0$ 0cut orthogonally if

A. $g_1g_2 + f_1f_2 = ac_1 + bc_2$

B. $2g_1g_2 + f_1f_2 = bc_1 + ac_2$

C. $bg_1g_2 + af_1f_2 = bc_1 + ac_1$

D. $g_1g_2 + f_1f_2 = c_1 + c_2$

Answer:

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