MATHS

BOOKS - MARVEL MATHS (HINGLISH)

QUESTION PAPER 2018

Question

1. If $\int_0^k \frac{dx}{2+18x^2} = \frac{\pi}{24}$, then the value of k is

A. 3

B. 4

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

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

Answer: C

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2. The cartesian co - ordinates of the point on the parabola $y^2 = -16x$, whose parameter is $\frac{1}{2}$, are

A. $(-2, 4)$

B. $(4, -1)$

C. $(-1, -4)$

D. $(-1, 4)$

Answer:

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3. $\int \frac{1}{\sin x . \cos^2 x} dx =$

A. $\sec x + \log|\sec x + \tan x| + c$

B. $\sec x . \tan x + c$

C. $\sec x + \log|\sec x - \tan x| + c$

D. $\sec x - \log|\text{cosec}\ \ x + \cot x| + c$

Answer: D

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4. IF $\log_{10}\left(\frac{x^3 - y^3}{x^3 + y^3}\right) = 2$ then $\frac{dy}{dx} =$

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

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

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

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

Answer: D

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5. IF $f: R - \{2\} \to R$ is a function defined by $f(x) = \dfrac{x^2 - 4}{x - 2}$, then its range is

A. R

B. $R - \{2\}$

C. $R - \{4\}$

D. $R - \{-2, 2\}$

Answer: c

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6. IF $f(x) = x^2 + \alpha$ for $x \geq 0$ and $2\sqrt{x^2 + 1} + \beta$ for $x < 0$ is continuous at $x = 0$ and $f\left(\dfrac{1}{2}\right) = 2$, then $\alpha^2 + \beta^2$ is

A. 3

B. $\dfrac{8}{25}$

C. $\dfrac{25}{8}$

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

Answer: C

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7. IF $y = \left(\tan^{-1} x\right)^2$ then $\left(x^2+1\right)^2 \frac{d^2y}{dx^2} + 2x\left(x^2+1\right)\frac{dy}{dx} =$

A. 4

B. 2

C. 1

D. 0

Answer: B

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8. The line $5x + y - 1 = 0$ coincides with one of the lines given by $5x^2 + xy - kx - 2y + 2 = 0$ then the value of k is

A. -11

B. 31

C. 11

D. -31

Answer: C

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9. IF $A = \begin{bmatrix} 1 & 2 & 3 \\ -1 & 1 & 2 \\ 1 & 2 & 4 \end{bmatrix}$ then $\left(A^2 - 5A\right)A^{-1} =$

A. $\begin{bmatrix} 4 & 2 & 3 \\ -1 & 4 & 2 \\ 1 & 2 & 1 \end{bmatrix}$

B. $\begin{bmatrix} -4 & 2 & 3 \\ -1 & -4 & 2 \\ 1 & 2 & -1 \end{bmatrix}$

C. $\begin{bmatrix} -4 & -1 & 1 \\ 2 & -4 & 2 \\ 3 & 2 & -1 \end{bmatrix}$

D. $\begin{bmatrix} -1 & -2 & 1 \\ 4 & -2 & -3 \\ 1 & 4 & -2 \end{bmatrix}$

Answer: B

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10. The equation of line passing throufh $(3, -1, 2)$ and perpendicular to the lines

$\bar{r} = \left(\hat{i} + \hat{j} - \hat{k}\right) + \lambda\left(2\hat{i} - 2\hat{j} + \hat{k}\right)$ and $\bar{r} = \left(2\hat{i} + \hat{j} - 3\hat{k}\right) + \mu\left(\hat{i} - 2\hat{j}$

is

A. $\frac{x+3}{2} = \frac{y+1}{3} = \frac{z-2}{2}$

B. $\frac{x-3}{3} = \frac{y+1}{2} = \frac{z-2}{2}$

C. $\frac{x-3}{2} = \frac{y+1}{2} = \frac{z-2}{2}$

D. $\frac{x-3}{2} = \frac{y+1}{3} = \frac{z-2}{2}$

Answer: D

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11. Letters in the word $HULULULU$ are rearranged . The probability of all three L being together is

A. $\frac{3}{20}$

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

C. $\frac{3}{28}$

D. $\frac{5}{23}$

Answer: C

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12. The sum of the first 10 terms of the series $9 + 99 + 999 + \ldots\ldots,$ is

A. $\frac{9}{8}(9^{10} - 1)$

B. $\frac{100}{9}(10^9 - 1)$

C. $\left(10^9 - 1\right)$

D. $\frac{100}{9}\left(10^{10} - 1\right)$

Answer: B

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13. If A,B ,C are the angle of ΔABC then $\cot A.\ \cot B + \cot B.\ \cot C + \cot C.\ \cot A =$

A. 0

B. 1

C. 2

D. -1

Answer: B

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14. IF $\frac{dx}{\sqrt{16-9x^2}} = A\sin^{-1}(bx) + c$ then $A + B =$

A. $\frac{9}{4}$

B. $\frac{19}{4}$

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

D. $\frac{13}{12}$

Answer: D

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15. $\int e^x \left[\frac{2+\sin 2x}{1+\cos 2x}\right] dx =$

A. $e^x \tan x + c$

B. $e^x + \tan x + c$

C. $2e^x \tan x + c$

D. $e^x \tan 2x + c$

Answer: A

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16. A coin is tossed three times .If X denotes the absolute difference between the number of heads and the number of tails then $P(X=1)=$

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

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

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

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

Answer: D

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17. IF $2\sin\left(\theta+\frac{\pi}{3}\right)=\cos\left(\theta-\frac{\pi}{6}\right)$, then $\tan\theta=$

A. $\sqrt{3}$

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

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

D. $-\sqrt{3}$

Answer: D

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18. The area of the region bounded by $x^2 = 4y, y = 1, y = 4$ and the y-axis lying in the first quadrant is _____ square units .

A. $\frac{22}{3}$

B. $\frac{28}{3}$

C. 30

D. $\frac{21}{4}$

Answer: B

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19. If $f(x) = \frac{e^{x^2} - \cos x}{x^2}$, for $x \neq 0$ is continous at $x = 0$, then value of f(0) is

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

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

C. 1

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

Answer: D

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20. The maximum value of $2x + y$ subject to $3x + 5y \leq 26$ and $5x + 3y \leq 30, x \geq 0, y \geq 0$ is

A. 12

B. 11.5

C. 10

D. 17.33

Answer: A

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21. IF $\bar{a}, \bar{b}, \bar{c}$ are mutually perpendicular vectors having magnitudes 1,2,3 respectively

then $\left[\bar{a}+\bar{b}+\bar{c} \quad \bar{b}-\bar{a} \quad \bar{c}\right] = ?$

A. 0

B. 6

C. 12

D. 18

Answer: C

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22. IF points $p(4, 5, x), Q(3, y, 4)$ and $R(5, 8, 0)$ are collinear , then the value of $x + y$ is

A. -4

B. 3

C. 5

D. 4

Answer: D

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23. IF the slope of one of the lines given by $ax^2 + 2hxy + by^2 = 0$ is two times the other then

A. $8h^2 = 9ab$

B. $8h^2 = 9ab^2$

C. $8h = 9ab$

D. $8h = 9ab^2$

Answer: A

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24. The equation of the line passing through the point $(-3, 1)$ and bisecting the angle between co - ordinate axes is

A. $x + y + 2 = 0$

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

C. $x - y + 4 = 0$

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

Answer:

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25. The negation of the statement : Getting above 95% marks is neccary condition for hema to get the admission in good college ".

A. hema gets above above 95 % marks but she does not get the admission in good college

B. `hema does not get above 95 % marks and she gets admission in good college

C. If hema does not get above 95% marks then she will not get the admission in good college

D. hema does not get above 95% marks of she gets the admission in good college .

Answer: B

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

A. 0

B. 1

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

D. -1

Answer: A

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27. If planes $x - cy - bz = 0, cx - y + az = 0$ and $bx + ay - z = 0$ pass through a staight line the $a^2 + b^2 + c^2 =$

A. $1 - abc$

B. $abc - 1$

C. $1 - 2abc$

D. $2abc - 1$

Answer: C

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28. The point of intersection of lines represented by $x^2 - y^2 + x + 3y - 2 = 0$ is

A. $(1, 0)$

B. $(0, 2)$

C. $\left(\frac{1}{2}, \frac{3}{2}\right)$

D. $\left(\frac{1}{2}, \frac{1}{2}\right)$

Answer: C

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29. A die is rolled .IF X denotes the number of positive divisors of the outcome then the range of the random variable X is

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

B. $\{1, 2, 3, 4\}$

C. $\{1, 2, 3, 5, 6, \}$

D. $(1, 3, 5\}$

Answer: B

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30. A die is thrown for times .The probability of getting perfect square in at least one throw is

A. $\frac{16}{81}$

B. $\frac{65}{81}$

C. $\frac{23}{81}$

D. $\frac{58}{81}$

Answer: B

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31. $\int_0^{\pi/4} x.\sec^2 x dx = ?$

A. $\frac{\pi}{4} + \log\sqrt{2}$

B. $\frac{\pi}{4} - \log\sqrt{2}$

C. $1 + \log\sqrt{2}$

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

Answer: B

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32. In ΔABC, with usual notations, if a,b,c are in AP then $a\cos^2\left(\frac{C}{2}\right) + \cos^2\left(\frac{A}{2}\right) =$

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

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

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

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

Answer: C

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33. If $x = e^{\theta}(\sin\theta - \cos\theta), y = e^{\theta}(\sin\theta + \cos\theta)$ then $\frac{dy}{dx}$ at $\theta = \frac{\pi}{4}$ is

A. 1

B. 0

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

D. $\sqrt{2}$

Answer: A

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34. The number of solutions of $\sin x + \sin 3x + \sin 5x = 0$ in the interval $\left[\frac{\pi}{2}, \frac{3\pi}{2}\right]$ is

A. 2

B. 3

C. 4

D. 5

Answer: B

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35. IF $\tan^{-1} 2x + \tan^{-1} 3x = \frac{\pi}{4}$, then x=

A. -1

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

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

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

Answer: A::C

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36. Matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 1 & 5 \\ 2 & 4 & 7 \end{bmatrix}$ then the value of $A_{31}A_{31} + a_{32}A_{32} + a_{33}A_{33}$ is

A. 1

B. 13

C. -1

D. -13

Answer: C

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37. The contrapositive of the statement: "If the weather is fine then my friends will come and we go for a picnic".

A. The weather is fine but my friends will not come or we do not go for a picnic .

B. If my friends do not come or we do not go for picnic then weather will not be fine .

C. IF the weather is not fine then my friends will not come or we do not for a picnic .

D. the weather is not but my friends will come and we go for a picnic .

Answer: B

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38. If $= \frac{x}{x^2+1}$ is increasing function, then the value of x lies in

A. R

B. $(-\infty, -1)$

C. $(1, \infty)$

D. $(-1, 1)$

Answer: D

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39. If $X = \{4^n - 3n - 1 : n \in N\}$ and $\{9(n-1) : n \in N\}$, the prove that $X \subset Y$.

A. X

B. Y

C. ϕ

D. $\{0\}$

Answer: A

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40. The statement pattern $p \wedge (\sim p \wedge q)$is

A. A tautology

B. a contradiction

C. equivalent to $p \wedge q$

D. equivalent to $p \vee q$

Answer: B

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41. If the line $y = 4x - 5$ toches to the curve $y^2 = ax^3 + b$ at the point (2,3) then $7a + 2b =$

A. 0

B. 1

C. -1

D. 2

Answer: A

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42. The sides of a recyangle are given by $x = \pm a$ and $y = \pm b$ The equaton of the circle passing through the vertices of the rectangle is

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

B. $x^2 + y^2 = a^2 + b^2$

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

D. $(x - a)^2 + (y - b)^2 = a^2 + b^2$

Answer: B

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43. The minimum value of the function $f(x) = x \log x$ is

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

B. $-e$

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

D. e

Answer: A

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44. If $X \sim B(n, p)$ with $n = 10, p = 0.4$ the $E(X^2) = ?$

A. 4

B. 2.4

C. 3.6

D. 18.4

Answer: D

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45. The general solution of differential equation $\frac{dx}{dy} = \cos(x+y)$ is

A. $\tan\left(\frac{x+y}{2}\right) = y + c$

B. $\tan\left(\frac{x+y}{2}\right) = x + c$

C. $\cot\left(\frac{x+y}{2}\right) = y + c$

D. $\cot\left(\frac{x+y}{2}\right) = x + C$

Answer: A

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46. IF planes $\bar{r}.\left(p\hat{i} - \hat{j} + 2\hat{k}\right) + 3 = 0$ and $\bar{r}.\left(2\hat{i} - p\hat{j} - \hat{k}\right) - 5 = 0$ include angle $\frac{\pi}{3}$ then the value of p is

A. $1, \ -3$

B. $-1, 3$

C. -3

D. 3

Answer: D

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47. The order of the differential equation of all parabolas , whose latus rectum is 4a and axis parallel to the x- axis is

A. one

B. four

C. three

D. Two

Answer: D

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48. IF lines $\frac{x-1}{2}=\frac{y+1}{3}=\frac{z-1}{4}$ and $x-3=\frac{y-k}{2}=z$ intersect then the value of k is

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

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

C. $\frac{5}{2}$

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

Answer: A

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49. If a line makes angle 120° and 60° with the positive directions of X and Z-axes respectively, then the angle made by theline with positive Y-axis is

A. 150°

B. 60°

C. 135°

D. 120°

Answer: C

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50. L and M are two points with position vectors $2\vec{a} - \vec{b}$ and $\vec{a} + 2\vec{b}$, respectively. The position vector of the pont N which divides the line segment LM in the ratio 2:1 externally is

A. $3\bar{b}$

B. $4\bar{b}$

C. $5\bar{b}$

D. $3\bar{a} + 4\bar{b}$

Answer: C

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