MATHS

BOOKS - TS EAMCET PREVIOUS YEAR PAPERS

AP EAMCET SOLVED PAPER 2019

Mathematics

1. $\sin^4\frac{\pi}{8}+\sin^4\frac{2\pi}{8}+\sin^4\frac{3\pi}{8}+\sin^4\frac{4\pi}{8}$
$+\sin^4\frac{5\pi}{8}+\sin^4\frac{6\pi}{8}+\sin^4\frac{7\pi}{8}=$

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

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

C. C 3

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

Answer: C

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2. If $x : y : = \tan\left(\frac{\pi}{15} + \alpha\right) : \tan\left(\frac{\pi}{15} + \beta\right) :$

$\tan\left(\frac{\pi}{15} + \gamma\right), \quad \text{then} \quad \frac{z+x}{z-x}\sin^2(\gamma - \alpha) + \frac{x+y}{x-y}$

$\sin^2(\alpha - \beta) + \frac{y+x}{y-z}\sin^2(\beta - \gamma) =$

A. $\sin^2\theta$

B. $\cos^2\theta$

C. 0

D. 1

Answer: C

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3. Let [x] denote the largest integer $\leq x.$ If the number of solutions of

$\cos^2\theta$ is k, then for

$x \in \left[\frac{\pi}{4}, \frac{\pi}{3}\right]$ the value of $k^{\tan^2 x}$

A. is equal to 1

B. lies in between 2^1 and 2^3

C. is equal to zero

D. lies in between $\frac{1}{2^3}$ and $\frac{1}{2}$

Answer: C

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4. If α and β are the least and the greatest values of $f(x) = (\sin^{-1} x)^2 + (\cos^{-1} x)^2$ for all $x \in$ R respectively, then $8(\alpha + \beta) =$

A. A π^2

B. B $11\pi^2$

C. C $9\pi^2$

D. D $25\pi^2$

Answer: B

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5. If $x \in \left(\frac{-\pi}{2}, \frac{\pi}{2}\right)$, then log sec x =

A. $2 \quad \text{cosech}^{-1}\left(\cot^2\frac{x}{2} - 1\right)$

B. $2 \quad \text{cosech}^{-1}\left(\cot^2\frac{x}{2} + 1\right)$

C. $2 \quad \coth^{-1}\left(\text{cosec}^2\frac{x}{2} - 1\right)$

D. $2 \quad \coth^{-1}\left(\text{cosec}^2\frac{x}{2} + 1\right)$

Answer: C

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6. The area (in square units) of ΔABC if

$\angle A = 75^\circ, \angle B = 45^\circ \text{ and } a = 2(\sqrt{3} + 1)$ is

A. 6

B. $2\sqrt{3}$

C. $6-2\sqrt{3}$

D. $6+2\sqrt{3}$

Answer: D

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7. In $\Delta ABC, \quad \text{if} \quad 3a=b+c$, then $\cot\frac{B}{2}.\cot\frac{C}{2}$=

A. 1

B. 2

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

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

Answer: B

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8. In a $\Delta ABC, \quad \text{if} \quad \frac{2r_2r_3}{r_2 - r_1} = r_3 - r_1$ then $\frac{r_1(r_2+r_3)}{\sqrt{r_1r_2 + r_2r_3 + r_3r_1}} =$

A. $\frac{a^2+b^2+c^2}{\Delta^2}$

B. b - c

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

D. 2R

Answer: D

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9. If $3\hat{i} - 2\hat{j} - \hat{k}, 2\hat{i} + 3\hat{j} - 4\hat{k}, \ -\hat{i} + \hat{j} + 2\hat{k} \text{ and } 4\hat{i} + 5\hat{j} + \lambda\hat{k}$ are respectively the position vectors of four coplanar points P, Q, R and S, then $\lambda =$

A. $\frac{46}{17}$

B. $-\frac{46}{17}$

C. $\frac{146}{17}$

D. $-\frac{146}{17}$

Answer: D

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10. If $OA = 2\hat{i} + 2\hat{j} + \hat{k}, OB = 2\hat{i} + 4\hat{j} + 4\hat{k}$ and the length of the internal bisector of $\angle BOA$ of triangle AOB is k, then $9k^2 =$

A. A 225

B. B 136

C. C 712

D. D 20

Answer: B

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11. If $a + xb + yc = 0,$

$a \times b + b \times c + c \times a = 6(b \times c)$ then the locus of the point (x, y) is

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

B. $x + y - 5 = 0$

C. $2x + 6y = 5$

D. $x + y + 6 = 0$

Answer: B

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12. Let $A = (\alpha, 1, 2\alpha), B = (3, 1, 2)$ and $C = 4\hat{i} - \hat{j} + 3\hat{k}.$ If $AB \times C = 6\hat{i} + 9\hat{j} - 5\hat{k},$ then $\alpha^2 + \alpha + 5 =$

A. 11

B. 7

C. 9

D. 5

Answer: B

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13. The shortest distance between the skew lines

$r = \left(6\hat{i} + 2\hat{j} + 2\hat{k}\right) + t\left(\hat{i} - 2\hat{j} + 2\hat{k}\right)$ and

$r = \left(-4\hat{i} - \hat{k}\right) + s\left(3\hat{i} - 2\hat{j} - 2\hat{k}\right)$ is

A. 9

B. $\frac{40}{7}$

C. 108

D. 120

Answer: A

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14. If a makes an acute angle with $b, r \cdot a = 0$ and $r \times b = c \times b,$ then r =

A. $a \times c - b$

B. $c \times a$

C. $c - \left(\frac{c \cdot a}{b \cdot a}\right) b$

D. $c + \left(\frac{c \cdot a}{b \cdot a}\right) b$

Answer: C

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15. For a data consisting of 15 observations $x_i, i = 1, 2, 3, \ldots, 15$ the following results are obtained : $\sum_{i=1}^{15} x_i = 170, \sum_{i=1}^{15} x_i^2 = 2830.$ If one of the observation namely 20 was found wrong and was replaced by its correct value 30, then the corrected variance is

A. 80

B. 78

C. 76

D. 75

Answer: B

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16. A and B each select one number at random from the distinct numbers 1, 2, 3, ..., n and the probability that the number selected by a is less than the number selected by B is `(1009)/(2019). Now the probability that the number selected by B is the number immediately next to the number selected by A is

A. $\frac{2018}{2019}$

B. $\frac{2018}{(2010)^2}$

C. $\frac{2000}{(2019)}$

D. $\frac{2000}{(2019)^2}$

Answer: B

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17. There are 3 bags A , B and C. Bag A contains 2 white and 3 black balls, bag B contains 4

white and 2 black balls and Bag C contains 3

white and 2 black balls. If a ball is drawn at random from a randomly chosen bag, then the probability that the ball drawn is black, is

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

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

C. C $\frac{5}{9}$

D. D $\frac{1}{9}$

Answer: B

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18. If a random variable X has the probability distrbution given by

$P(X=0)=2C^3$,

$P(X=2)=5C-10C^2$ and $P(X=4)=4C-1$,

then the variance of that distribution is

A. $\frac{68}{9}$

B. $\frac{22}{9}$

C. $\frac{612}{81}$

D. $\frac{128}{81}$

Answer: D

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19. A box contains 30 toys of same size in which 10 toys are white and all the remaining toys are blue. A toy is drawn at random from the box and it is replacecd in the box after noting down its colour. If 5 toys are drawn in this way, then the probability of getting atmost 2 white toys is

A. A $\left(\frac{6}{9}\right)^2$

B. B $\left(\frac{8}{9}\right)^2$

C. C $\left(\frac{7}{9}\right)^2$

D. D $\left(\frac{2}{3}\right)^2$

Answer: B

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20. The locus of the point of intersection of the lines $x\sin\theta + (1-\cos\theta)y = a\sin\theta$ and $x\sin\theta - (1+\cos\theta)y + a\sin\theta = 0$ is

A. straight line

B. circle

C. parabola

D. hyperbola

Answer: B

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21. A line L has intercepts a and b on the coordinate axes. When the axes are rotated through a given angle θ keeping the origin fixed, this line L has the intercepts p and q. Then

A. $a^2 + b^2 = p^2 + q^2$

B. $a^2 + p^2 = b^2 + q^2$

C. $\frac{1}{a^2} + \frac{1}{p^2} = \frac{1}{b^2} + \frac{1}{q^2}$

D. $\frac{1}{a^2} + \frac{1}{b^2} = \frac{1}{p^2} + \frac{1}{q^2}$

Answer: D

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22. If O is the origin and A and B are points on the line $3x - 4y + 25 = 0$ such that $OA = OB = 13$, Then the area of ΔOAB (In sq units) is

A. 30

B. 120

C. 60

D. 65

Answer: C

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23. If $P(\alpha, \beta)$ be a point on the line $3x + y = 0$ such that the point P and the point Q(1, 1) lie on either side of the line $3x = 4y + 8$ then

A. $\alpha > \frac{8}{15}, \beta < \frac{-8}{5}$

B. $\alpha < \frac{8}{15}, \beta < \frac{-8}{5}$

C. $\alpha > \frac{8}{15}, \beta > \frac{-8}{5}$

D. $\alpha < \frac{8}{15}, \beta > \frac{-8}{5}$

Answer: A

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24. Two vertices of a triangle are (5,-1) and (-2,3). If the orthocentre of the triangle is the origin, find the third vertex.

A. $(4, 7)$

B. $\left(-2, \frac{-7}{2}\right)$

C. $(-4, -7)$

D. $(-2, 3)$

Answer: C

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25. The distance from the origin to the orthocentre of the triangle fromed by the lines $x + y - 1 = 0$ and $6x^2 - 13xy + 5y^2 = 0$ is

A. $\frac{11\sqrt{2}}{2}$

B. 13

C. 11

D. $(11\sqrt{2})$

Answer: D

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26. The combined equation of two lines L and L_1 is $2x^2 + axy + 3y^2 = 0$ and the combined equation of two lines L and L_2 is $2x^2 + bxy - 3y^2 = 0$. If L_1 and L_2 are perpendicular, then $a^2 + b^2 =$

A. 26

B. 29

C. 13

D. 85

Answer: A

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27. The power of the point $B(-1, 1)$ with respect to the circle $S \equiv x^2 + y^2 - 2x - 4y + 3 = 0$ is p. If the length of the tangent drawn from B to the circles $S = 0$ is t, then the point (2, 3) with respect to circle $S' = 0$ having centre at (p, t^2) and passing through the origin.

A. lies inside the circle $S' = 0$

B. lies outside the circle $S' = 0$

C. lies on the circle $S' = 0$

D. is the centre of the circle $S' = 0$

Answer: A

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28. If tangents are drawn to the circle $x^2 + y^2 = 12$ at the points where it intersects the circle $x^2 + y^2 - 5x + 3y - 2 = 0$ then the coordinates of the points of intersection of those tangents are

A. $\left(-6, \frac{18}{5}\right)$

B. $\left(6, \frac{18}{5}\right)$

C. $\left(-6, \frac{-18}{5}\right)$

D. $\left(6, \frac{-18}{5}\right)$

Answer: D

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29. If the point of intersection of the pair of the transverse common tangents and that of the pair of direct common tangents drawn to the circles $x^2 + y^2 - 14x + 6y + 33 = 0$ and $x^2 + y^2 + 30x - 2y + 1 = 0$ are T and D respectively, then the centre of the circle having TD as diameter is

A. $\left(\frac{39}{2}, \frac{-7}{4}\right)$

B. $\left(\frac{39}{4}, \frac{7}{2}\right)$

C. $\left(\frac{39}{4}, \frac{-7}{2}\right)$

D. $\left(\frac{39}{2}, \frac{-7}{2}\right)$

Answer: C

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30. If the circles $x^2 + y^2 + 2\lambda x + 2 = 0$ and $x^2 + y^2 + 4y + 2 = 0$ touch each other, then $\lambda =$

A. ± 1

B. ± 2

C. ± 3

D. ± 4

Answer: B

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31. The equation of the circle whose diameter is the common chord of the circles

$x^2 + y^2 + 2x + 3y + 1 = 0$ and

$x^2 + y^2 + 4x + 3y + 2 = 0$ is

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

B. $2x^2 + 2y^2 + 2x + 6y + 1 = 0$

C. $2x^2 + 2y^2 + 4x - 3y - 1 = 0$

D. $x^2 + y^2 + 2x + 6y - 2 = 0$

Answer: B

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32. If the forcus of a parabola divides a focal chord of the parabola into segments of lengths 5, 3 units, then the length of the latusrectum of that parabola is

A. $\frac{15}{4}$

B. 20

C. $\frac{25}{2}$

D. $\frac{15}{2}$

Answer: D

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33. The angle between the tangents drawn to the parabola $y^2 = 4x$ from the point (1, 4) is

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

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

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

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

Answer: B

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34. If the tangent drawn to the parabola $y^2 = 4x$ at $(t^2, 2t)$ is the normal to the ellipse $4x^2 + 5y^2 = 20$ at $(\sqrt{5}\cos\theta, 2\sin\theta)$, then

A. $5t^4 + 4t^2 = 1$

B. $\frac{5}{t^4} + \frac{100}{t^2} = 1$

C. $t = \sin\theta$

D. $\cos\theta = t + 1$

Answer: A

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35. If the tangents drawn from a point P to the ellipse $4x^2 + 9y^2 - 24x + 36y = 0$ are perpendicular, then the locus of P is

A. $x^2 + y^2 - 6x + 4y + 13 = 0$

B. $x^2 + y^2 - 6x + 4y - 13 = 0$

C. $x^2 + y^2 + 6x - 4y - 13 = 0$

D. $x^2 + y^2 = 26$

Answer: B

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36. The locus of the mid-points of the chords of the circle $x^2 + y^2 = 16$ which are the tangents to the hyperbola $9x^2 - 16y^2 = 144$ is

A. $3x^2 - 4y^2 = 16(x^2 + y^2)$

B. $4x^2 - 3y^2 = 9(x^2 + y^2)$

C. $16x^2 - 9y^2 = (x^2 + y^2)^2$

D. $16x^2 - 9y^2 = 4(x^2 + y^2)$

Answer: C

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37. A $(3, 2, -1), B(4, 1, 1), C(6, 2, 5)$ are three points. If D, E, F are three points which divide BC, CA, AB respectively in the same ratio $2:1$ then the centroid of ΔDEF is

A. $\left(\frac{13}{3}, \frac{5}{3}, \frac{5}{3}\right)$

B. $(13, 5, 5)$

C. $(4, 2, 1)$

D. $\left(\frac{11}{3}, \frac{4}{3}, \frac{1}{3}\right)$

Answer: A

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38. If $A = (1, 8, 4), B = (2, -3, 1)$, then the direction cosines of a normal to the plane AOB is

A. A $\frac{2}{\sqrt{78}}, \frac{5}{\sqrt{78}}, \frac{-7}{\sqrt{78}}$

B. B $\frac{2\sqrt{10}}{9}, \frac{7\sqrt{10}}{90}, \frac{-19\sqrt{10}}{90}$

C. C $\frac{4}{\sqrt{218}}, \frac{9}{\sqrt{218}}, \frac{-11}{\sqrt{218}}$

D. D $\frac{2}{11}, \frac{6}{11}, \frac{-9}{11}$

Answer: B

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39. The lines $\frac{x-1}{2} = \frac{y+1}{3} = \frac{z-1}{4}$ and $\frac{x-3}{1} = \frac{y-k}{2} = \frac{z}{1}$ intersect if K equals

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

B. $-\frac{2}{9}$

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

D. 0

Answer: C

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40. $\lim_{x \to 0} \frac{x^2(\tan 2x - 2\tan x)^2}{(1-\cos 2x)^4} =$

A. 4

B. 2

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

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

Answer: D

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41. $\lim_{x \to \infty} \left(\frac{6x^2 - \cos 3x}{x^2 + 5} - \frac{5x^3 + 3}{\sqrt{x^6 + 2}} \right) =$

A. 11

B. 0

C. -1

D. 1

Answer: A

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42. The number of discontinuities in R for the function $f(x) = \frac{x - 1}{x^3 + 6x^2 + 11x + 6}$ is

A. 3

B. 2

C. 1

D. 0

Answer: A

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43. $\frac{d}{dx}\left(\log\left(\sqrt{x+\sqrt{x^2+a^2}}\right)\right) =$

A. $\sqrt{x^2+a^2}$

B. $\frac{1}{\sqrt{x^2+a^2}}$

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

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

Answer: C

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44. $f(x) = \cot^{-1}\left(\frac{x^x - x^{-x}}{2}\right)$ then $f^1(1) =$

A. $-\log 2$

B. $\log 2$

C. 1

D. -1

Answer: D

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45. If $a. \neq 0, x = a(t + \sin t)$ and $y = a(1 - \cos t)$ then $\frac{d^2y}{dx^2}$ at $t = \frac{2\pi}{3}$ is

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

B. $\frac{1}{4a}$

C. $4a$

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

Answer: A

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46. The number of tangent to the curve $y^2(x-a)=x^2(x+a)(a>0)$ that are parallel to the X - axis is

A. infinitely many

B. 0

C. 1

D. 2

Answer: B

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47. If $f(x) = (2k+1)x - 3 - ke^{-x} + 2e^{x}$ is monotonically increasing for all $x \in R$ then the least value of k is

A. 1

B. 0

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

D. -1

Answer: B

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48. if the function $f(x) = ax^3 + bx^2 + 11x - 6$ satisfies the conditions of Rolle's theorem in $[1, 3]$ and $f\left(2 + \frac{1}{\sqrt{3}}\right) = 0$ then $a + b =$

A. -5

B. -3

C. 4

D. 7

Answer: A

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49. For $a > 0$, if the function $f(x) = 2x^3 - 9ax^2 + 12a^2x + 1$ attains its maximum value at p and minimum value at q such that $p^2 - q$ then $a =$

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

B. 1

C. 2

D. 4

Answer: C

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50. If $\int \cos x \cdot \cos 2x \cdot \cos 5x dx$

$= A \sin 2x + B \sin 4x + C \sin 6x + D \sin 8x + k$

(where k is the arbitrary constant of integration), then $\frac{1}{B} + \frac{1}{C} =$

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

B. $\frac{1}{A} + \frac{1}{D}$

C. 1

D. 0

Answer: B

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51. If $\int e^x \left(\frac{x+2}{x+4}\right)^2 dx = f(x)$ arbitrary constant, then $f(x) =$

A. $\frac{xe^x}{x+4}$

B. $\frac{e^x}{x+4}$

C. $x\frac{e^x}{(x+4)^2}$

D. $\dfrac{e^x}{(x+4)^2}$

Answer: A

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52. Evalute the following integrals

$$\int \frac{dx}{\sin x + \sin 2x}$$

A. $\dfrac{1}{2}\log_e|1+\cos x| + \dfrac{1}{6}\log_e|1-\cos x| - \dfrac{2}{3}\log_e|1+2\cos x| + c$

B. $\dfrac{1}{2}\log_e|1+\cos x| - \dfrac{2}{3}\log_e|1-\cos x| + \dfrac{1}{2}\log_e|1+2\cos x| + c$

C. $\dfrac{1}{2}\log_e|1+\sin x| - \dfrac{1}{3}\log_e|1-\sin x| - \dfrac{1}{3}\log_e|1+\cos x| + c$

D. $\dfrac{1}{2}\log_e|1-\sin x| + \dfrac{1}{2}\log_e|1+\cos x| - \dfrac{2}{3}\log_e|1-2\cos x| + c$

Answer: A

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53. In $I_n = \int \frac{\sin nx}{\sin x} dx$ for $n = 1, 2, 3, \ldots.$, then $I_6 =$

A. $\frac{3}{5}\sin 3x + \frac{8}{5}\sin^5 x - \sin x + c$

B. $\frac{2}{5}\sin 5x - \frac{5}{3}\sin^3 x - 2\sin x + c$

C. $\frac{2}{3}\sin 5x - \frac{8}{3}\sin^5 x + 4\sin x + c$

D. $\frac{2}{5}\sin 5x - \frac{8}{5}\sin^3 x + 4\sin x + c$

Answer: D

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54. If $\lim_{n\to\infty}\left[\left(1+\frac{1}{x^2}\right)\left(1+\frac{2^2}{n^2}\right)\ldots\left(1+\frac{n^2}{n^2}\right)\right]^{1/n} = k$, then log k =

A. $\log 4 + \frac{\pi}{2} - 1$

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

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

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

Answer: C

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55. $\int_0^{\pi/2} \frac{\sin^3 x \cos x dx}{\sin^4 x + \cos^4 x} =$

A. π

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

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

D. $\frac{\pi}{8}$

Answer: D

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56. The curve $y = ax^2 + bx$ passes through the point $(1, 2)$ and lies above the X- axis for $0 \leq x \leq 8$. If the are enclosed by this curve, the X - axis and the line $x = 6$ is 108 square units, then $2b - a =$

A. 2

B. 0

C. 1

D. -1

Answer: B

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57. The differential equation of all parabolas whose axes are parallel to Y - axis is

A. $\frac{d^3y}{dx^3} = 0$

B. $\frac{d^2y}{dx^2} = 0$

C. $\frac{d^2y}{dx^2} + \frac{dy}{dx} = 0$

D. $\frac{d^2y}{dx^2} + \left(\frac{dy}{dx}\right)^2 = 0$

Answer: A

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58. The solution of the equation $\frac{dy}{dx} = 2y\tan x = \sin x$ satisfying $y = 0$ when $x = \frac{\pi}{3}$, is

A. $y = 2\sin^2 x + \cos x - 2$

B. $y = 2\sin^2 x - \cos x - 2$

C. $y = 2\cos^2 x - \sin x + 2$

D. $y = 2\cos x - \sin^2 x - 1$

Answer: A

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59. Let f be a function such that $f(xy) = \frac{f(x)}{y}$ for all positive real numbers x, y. If f(20) = 15, then f(50) =

A. $\frac{75}{2}$

B. 12

C. 6

D. 75

Answer: C

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60. If $f: A \to B$ is a function defined by $f(x) = \frac{x^2 - x}{x^2 + 2x}$, then which one of the following is true?

A. A = R - {0, -2}, B = R and f(x) is decreasing function

B. A = R - {-2}, B = R - {1} and $f^{-1}(x)$ is decreasing function

C. A = R - {0, -2}, B = R - {1} and $f^{-1}(x)$ is increasing function

D. Both f(x) and $f^{-1}(x)$ are increasing functions

Answer: C

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61. The statement "$n^5 - 5n^3 + 4n$ is divisible by 120" is true for

A. n = 1 only

B. n = 10 only

C. n = 100 only

D. All positive integer values of n

Answer: D

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62. Let $A = \begin{bmatrix} 7 & 5 \\ 4 & 8 \end{bmatrix}, B = \begin{bmatrix} 4 & 3 \\ 7 & 5 \end{bmatrix}$ and $C = \begin{bmatrix} -5 & 3 \\ 7 & -4 \end{bmatrix}$

IF Tr(S) denotes the trace of a square matrix S then

$$\sum_{k=0}^{\infty} \frac{1}{3^k} Tr\left\{A(BC)^k\right\} =$$

A. $\frac{45}{2}$

B. 36

C. $\frac{81}{2}$

D. 9

Answer: A

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63. If the inverse of the matrix $A = \begin{bmatrix} 3 & 4 & 5 \\ 2 & -1 & 8 \\ 5 & -2 & 7 \end{bmatrix}$ is B, then $B^T =$

A. $\frac{1}{136}\begin{bmatrix} 9 & 26 & 1 \\ -38 & -4 & 26 \\ 37 & -14 & -11 \end{bmatrix}$

B. $\frac{1}{136}\begin{bmatrix} 9 & -38 & 37 \\ 26 & -4 & -14 \\ 1 & 26 & -11 \end{bmatrix}$

C. $\frac{1}{136}\begin{bmatrix} 9 & 26 & 1 \\ 37 & -14 & -11 \\ -38 & -4 & 26 \end{bmatrix}$

D. $\frac{1}{136}\begin{bmatrix} 9 & 1 & 26 \\ -38 & 26 & -4 \\ 37 & -11 & -14 \end{bmatrix}$

Answer: A

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64. If $x = \alpha, y = \beta, z = \gamma$ is the solution of the system of equations $x + y + z = 4, 2x - y + 3z = 9, 3x + y + 2z = 8, \quad \text{then} \;\; 4\alpha + 2\beta + 3\gamma =$

A. 0

B. 1

C. 12

D. 19

Answer: C

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65. $\left(\dfrac{2}{i + \sqrt{3}}\right)^{100} + \left(\dfrac{2}{i - \sqrt{3}}\right)^{100} =$

A. 2

B. 1

C. -1

D. -2

Answer: C

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66. If $a = 3 + 4i, z_1$ and z_2 are two complex numbers such that $|z_1| = 3$ and $|z_2 - a| = 2$, then the maximum value of $|z_1 - z_2|$ is

A. 5

B. 10

C. 15

D. 20

Answer: B

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67. If α is the real root and β, γ are the complex roots of the equation $x^3 + 3x^2 + 3x + 28 = 0, \quad \text{then} \quad 2\alpha + 3\beta + 3\gamma =$

A. -5

B. 0

C. 5

D. -23

Answer: A

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68. Given that $\alpha, \beta, \gamma, \delta$ are in a geometric progression. If α, β are the roots of $x^2 - x + p = 0$ and γ, δ are the roots of $x^2 - 4x + q = 0$, where p and q are integers, then the ordered pair (p, q) =

A. (2, 32)

B. (2, -32)

C. (-2, 32)

D. (-2, -32)

Answer: D

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69. If A, B, C are the sets of all values of x, for which $x^2 - 5x - 14$ is positive, $-6x^2 + 2x - 3$ is negative and $4x - 5x^2 + 2$ is negative respectively, then $A \cap B \cap C =$

A. (-2, 7)

B. ϕ

C. $\left(\frac{2-\sqrt{14}}{5}, \frac{2+\sqrt{14}}{5}\right)$

D. R

Answer: C

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70. The complex solution set of the inequation $\sqrt{x^2 - 3x + 2} > (3 - x)$ is

A. $\left(\frac{7}{3}, 3\right]$

B. $(3, \infty)$

C. $(-\infty, 1] \cup [2, \infty)$

D. $\left(\frac{7}{3}, \infty\right)$

Answer: D

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71. Solve the equation $6x^4 - 35x^3 + 62x^2 - 35x + 6 = 0$.

A. 2

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

C. 3

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

Answer: C

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72. I. The number of all ten digited numbers that can be formed with all the distinct digits and which ar divisble by 4 is 15×81.

II. The number of positive integers that can be formed by using the digits 0, 1, 2, 3, 4, 5 without any repetition is 630.

A. Only I is true

B. Only II is true

C. Both I and II are true

D. Both I and II are false

Answer: B

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73. A man has 5 male and 4 female relatives. His wife has 4 male and 5 female relatives. The number of ways in which they can invite 5 male and 5 female relatives so that 5 of them are man's relatives and remaining 5 are his wife's relatives

A. A 5426

B. B 5226

C. C 5526

D. D 5626

Answer: D

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74. If the coefficients of $r^{th}, (r+1)^{th}$ and $(r+2)^{th}$ terms in the expansion of $(1+x)^{14}$ are in an arithmetic progression, then r =

A. 4 or 10

B. 5 or 9

C. 8 or 6

D. 7

Answer: B

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75. If $x = \frac{5}{(2!).3} + \frac{5.7}{(3!).3^2} + \frac{5.7.9}{(4!).3^3} + \ldots.$

then find the value of $x^2 + 4x$.

A. 17

B. 23

C. 27

D. 39

Answer: B

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76. If the periods of the functions sin(ax+b) and tan(cx+d) are respectively $\frac{4}{7}$ and $\frac{2}{5}$, then $\sin(|a|+|c|)+\cos(|a|-|c|)=$

A. -1

B. 0

C. 1

D. 2

Answer: A

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77. The smallest positive value of x (in degress) for whiich $\tan(x+100^\circ)=\tan(x+50^\circ).\tan x\tan(x-50^\circ)$ is

A. 25°

B. $82\frac{1}{2^\circ}$

C. 55°

D. 30°

Answer: D

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78. For $\alpha \neq 0, \quad \text{if} \quad \cos(\theta + \alpha), \cos\theta \quad \text{and} \quad \cos(\theta - \alpha)$ are in harmonic progression, then $\sec^2\theta \cdot \cos^2\frac{\alpha}{2} =$

A. 2

B. 1

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

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

Answer: C

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79. If $\cos 2\theta + \alpha \sin \theta = 2\alpha - 7$ has a solution, then

A. $\alpha \in [-2, 4]$

B. $\alpha \in [-6, -2]$

C. $\alpha \in [6, 8]$

D. $\alpha \in [2, 6]$

Answer: D

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80. If x = a is a solution of the equation $\sin^{-1}\frac{x}{3} + \sin^{-1}\frac{2x}{3} = \sin^{-1} x,$ then the roots of the equation $x^2 - ax - 1 = 0$ are

A. ± 1

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

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

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

Answer: A

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81. The set of all real values of x for which

$$f(x) = \log_e \sqrt{\frac{1+x}{1-x}} + \log_e\left(\frac{1+\sqrt{1-x^2}}{x}\right) + \coth^{-1} x + \log_e\left(\frac{1+\sqrt{1}}{x}\right.$$

is defined is

A. ϕ

B. (0, 1)

C. (-1, 1)

D. (0, 1]

Answer: B

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82. If $A = 60^\circ \text{ then } \frac{1}{a+b} + \frac{1}{a+c} =$

A. $\frac{3(1+b-c)}{a+b+c}$

B. $\frac{2}{a+b+c}$

C. $\frac{3}{a+b+c}$

D. $\frac{a+b+c}{3a^2}$

Answer: C

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83. In a $\Delta ABC, 8R^3 \sum \sin^3 A \cos(B-C) =$

A. abc

B. 4abc

C. $3R\Delta$

D. $12R\Delta$

Answer: D

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84. In a ΔABC, if $a:b:c=4:5:6$, then the ratio of the radius of the circumcircle to the radius of the incircle is

A. $13:7$

B. $15:7$

C. $16:7$

D. $17:9$

Answer: C

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85. a, b, c are three mutually perpendicular unit vectors in the right handed system. If the points P, Q, R with position vectors $2a+5b-4c, a+4b-3c$ and $ka+7b-6c$ respectively lie on a line, then the ratio in which the point P divides QR is

A. $1:2$

B. $-1:3$

C. $3:1$

D. $-1:2$

Answer: A

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86. Let π be the plane passing through the points $\hat{i}, \hat{j}, \hat{i}+\hat{j}+\hat{k}$ and L be the line passing through the point $\hat{i}+2\hat{j}+3\hat{k}$ and parallel to the vector $\hat{i}-\hat{j}+\hat{k}$. If $P(\alpha, \beta, \gamma)$ is the point of intersection of the plane π and line L, then $\sqrt{(\alpha^2+\beta^2)\gamma^2} =$

A. 0

B. 1

C. 6

D. $\sqrt{14}$

Answer: C

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87. If $a = \hat{i} - \hat{j} - \hat{k}, b = 2\hat{i} - 3\hat{j} + \hat{k}$ and p_1, p_2 are the orthogonal projection vectors of a on b and b on a respectively, then $(p_1 + p_2) \cdot (p_1 - p_2) =$

A. $-\frac{46}{21}$

B. $\frac{25}{7}$

C. $\frac{44}{7}$

D. $-\frac{88}{21}$

Answer: D

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88. Let a, b, c be three non-coplanar vectors and $a' = \frac{b \times c}{[abc]}, b' = \frac{c \times a}{[abc]}, c' = \frac{a \times b}{[abc]}$. The length of the altitude of the parallelopiped formed by a a', b', c' as coterminous edges, with respect to the base having a' and c' as its adjacent sides is

A. $|a|$

B. $\frac{1}{|b|}$

C. $|c|$

D. $\frac{1}{|a \times c|}$

Answer: B

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89. Let a, b, c be three non-coplanar vectors. Let $S_i (i = 1, 2, 3, 4, 5, 6)$ denonte the six scalar triple products formed by all possible permutations of a, b, c. If i, j, k, l are randomly chosen distinct numbers from 1 to 6 and if $x = \frac{S_i}{S_j} + \frac{S_k}{S_l}, y = \frac{S_i}{S_j} - \frac{S_k}{S_l}$, then $x^2 + y^2 =$

A. 1

B. 4

C. 8

D. 2

Answer: B

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90. If $a = \hat{i} - 2\hat{j} + \hat{k}, b = \hat{i} + 3\hat{j} - 2\hat{k}, c = 2\hat{i} + \hat{j} - \hat{k}$ and $d = \hat{i} + \hat{j} + \hat{k}$, then the volume (in cubic units) of the tetrahedron having $(a \times b) \times c, b, d$ as its coterminuous edges is

A. $\frac{15}{2}$

B. 90

C. $\frac{21}{2}$

D. $\frac{66}{5}$

Answer: C

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91. The mean deviation of the data 3, 5, 11, 13, 17, 19, 23, 29 about its arithmetic mean is

A. A. 8.5

B. B. 8

C. C. 7.2

D. D. 7

Answer: D

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92. If the weights of 10 persons (in kgs) are observed as : 45, 49, 55, 50, 41,44 , 60, 58, 53, 55, then the variance of their weights is

A. A 51

B. B 42.8

C. C 39.4

D. D 35.6

Answer: D

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93. If two dice are rolled at a time, then the probability of getting an odd number on the first die or a total of 7 on both dice is

A. $\frac{5}{9}$

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

C. $\frac{1}{12}$

D. $\frac{7}{12}$

Answer: D

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94. If A and B are two events of a random experiment such that $P(\overline{A}) = 0.3, P(B) = 0.4$ and $P(A \cap \overline{B}) = 0.5,$ then $P(A \cup B) + P($

A. 0.95

B. 1.15

C. 1.25

D. 0.25

Answer: B

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95. A speaks truth in 4 out of 5 times. A die is tossed. If A reports that there is 4 on the die, then the probability that there was 4 on the die, is

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

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

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

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

Answer: B

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96. Let S = {1, 2, 3,...., 50} and A_k be the set of multiples of k in S for $k \in N$. IF x_k is a number chosen from A_k, then match the items of List-I with the items of List-II.

List I		List II	
A.	$P(x_3 < 30)$	I.	$\frac{1}{2}$
B.	$P(15 < x_4 \leq 36)$	II.	$\frac{2}{3}$
C.	$P(x_7 > 35)$	III.	$\frac{2}{7}$
D.	$P(x_{11} > 11)$	IV.	$\frac{1}{4}$
		V.	$\frac{3}{4}$
		VI.	$\frac{9}{16}$

The correct match is

A. A B C D

VI I IV V

B. A B C D

III I VI V

C. A B C D

II V I IV

D. A B C D

VI I III V

Answer: D

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97. If X is a Poisson variate such that $P(X=2)=9P(X=4)$, then the mean and variance of X are

A. (1, 2)

B. (1, 1)

C. (2, 1)

D. (2, 2)

Answer: B

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98. Let P be the point (4, 1) and Q be its image in the line y = x. If Q is translated through a distance 2 units along the negative Y-axis to reach the point R, then the co-ordinates of R are

A. (-1, 2)

B. (1, -2)

C. (-1, -2)

D. (1, 2)

Answer: D

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99. The normal form of the line x+y+1=0 is

A. $x\cos(45^\circ) + y\sin(135^\circ) = \frac{1}{\sqrt{2}}$

B. $x\cos(45^\circ) + y\sin(45^\circ) = \frac{1}{\sqrt{2}}$

C. $x\cos(225^\circ) + y\sin(225^\circ) = \frac{1}{\sqrt{2}}$

D. $x\cos(45^\circ) + y\sin(45^\circ) = -\frac{1}{\sqrt{2}}$

Answer: C

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100. The vetices of a triangle are O(0, 0), B(-3, -1), C(-1, -3). The equation of the line parallel to BC and intersecting the sides OB and OC whose perpendicular distance from O is $1/2$ is

A. $x + y + \sqrt{2} = 0$

B. $2x + 2y - \sqrt{2} = 0$

C. $2x + 2y + \sqrt{2} = 0$

D. $2x - 2y + \sqrt{2} = 0$

Answer: B

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101. A variable line passing through a fixed point (α, β) intersects the coordinate axes at A and B. If O is the origin, then the locus of the centroid of the ΔOAB is

A. $\beta x + \alpha y = 3xy$

B. $\alpha x + \beta y = 3xy$

C. $\alpha x - \beta y = 3xy$

D. $\beta x - \alpha y = 3xy$

Answer: A

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102. If A is the orthocentre of the triangle formed by $2x^2 - y^2 = 0, x + y - 1 = 0$ and B is the centroid of the triangle formed by $2x^2 - 5xy + 2y^2 = 0, 7x - 2y - 12 = 0$, then the distance between A and B is

A. $\sqrt{5}$

B. 1

C. 5

D. $\sqrt{2}$

Answer: A

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103. The distance between the pair of lines represented by

$x^2 + 2\sqrt{2}xy + 2y^2 + 4x + 4\sqrt{2}y + 1 = 0$, is

A. 1

B. 2

C. $\sqrt{2}$

D. 4

Answer: B

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104. The number of integers α, for which a chord of the circle $x^2 + y^2 = 75$ is bisected at $(8, \alpha)$ and that the slope of the chord is an integer, is

A. 10

B. 8

C. 4

D. 3

Answer: B

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105. If the line $x - 6y - 12 = 0$ meets the circle $S \equiv x^2 + y^2 - 4x + 8y + 6 = 0$ at A and B, then the point of intersection of the tangents at A and B to S = 0 is

A. (1, 2)

B. (2, 1)

C. (-1, 2)

D. (2, -1)

Answer: A

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106. A circle of radius 5 units passes through A(-5, 0) and B(5, 0). If $P(5\cos\alpha, 5(\sin\alpha), Q(5\cos\beta, 5\sin\beta)$ are two points on this circle such that $\alpha - \beta = \frac{\pi}{2}$, then the locus of the point of intersection of the line AP and BQ is

A. $x^2 + y^2 - 10x - 25 = 0$

B. $x^2 + y^2 + 10x - 25 = 0$

C. $x^2 + y^2 + 10y - 25 = 0$

D. $x^2 + y^2 - 10y - 25 = 0$

Answer: D

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107. The condition that the circles which passes through the points $(0, a), (0, -a)$ and touch the line $y = mx + c$ will cut orthogonally is

A. $a^2 + m^2$

B. $a^2(1 + m)^2$

C. $a^2(1 + m^2)$

D. $a^2(1 + 2m^2)$

Answer: B

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108. For the system of circles given by $(x^2 + y^2 + 2gx) + \lambda(x^2 + y^2 + 2fy + l) = 0$, where $g \neq 0, f \neq 0$ and is a parameter, if the line joining the points circles of the system subtends a right angle at the origin, then $\frac{k}{f^2 =}$

A. -1

B. 1

C. 2

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

Answer: C

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109. For the parabola $y^2 + 2x + 2y - 3 = 0$, match the items in List-I with those from List-II.

List I		List II
A. Vertex	I.	$2x - 5 = 0$
B. Focus	II.	$\left(\frac{3}{2}, -1\right)$
C. Equation of the Directrix	III.	$x - 2 = 0$
D. Equation of the Axis	IV.	$y + 1 = 0$
	V.	$(2, -1)$
	VI.	$\left(2, \frac{3}{2}\right)$

The correct match is

A. A B C D

V VI I III

B. A B C D

V II I IV

C. A B C D

VI V IV I

D. A B C D

II VI III IV

Answer: B

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110. The area (in sq units) of the triangle formed by the normal to the parabola $y^2 = 16x$ whose slope is $\frac{1}{2}$ with the co-ordinates axes is

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

B. $\frac{27}{4}$

C. $\frac{54}{4}$

D. $\frac{81}{4}$

Answer: D

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111. If the major axis of an ellipse lies on the Y-axis, its minor axis lies on the X-axis and the length of its latusrectum is equal to $\frac{2}{3}$ of its minor axis, then the eccentricity of that ellipse is

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

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

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

D. $\frac{\sqrt{5}}{3}$

Answer: D

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112. If $y = x + c$ is a normal to the ellipse $\frac{x^2}{25} + \frac{y^2}{9} = 1, \quad \text{then} \quad c^2 =$

A. A $\frac{128}{17}$

B. B $\frac{17}{128}$

C. C 34

D. D 225

Answer: A

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113. The area (in sq units) of the quadrilateral formed by the four common tangents drawn to the two hyperbolas $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$ and $\frac{y^2}{a^2}-\frac{x^2}{b^2}=1(a>b)$ is

A. a^2-b^2

B. $2(a^2-b^2)$

C. $\frac{a^2-b^2}{\sqrt{2}}$

D. $\frac{a^2-b^2}{2}$

Answer: B

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114. The direction cosines of the line which is perpendicular to the lines with direction cosines proportional to (1, -2, -2) and (0, 2, 1) are

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

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

C. C $\frac{2}{3}, \frac{-1}{3}, \frac{2}{3}$

D. D $\frac{2}{3}, \frac{2}{3}, \frac{-1}{3}$

Answer: C

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115. The number of lines passing through (0, 0, 0) and making an angle of 45° with each of the three co-ordinate axes is

A. 0

B. 2

C. 4

D. 8

Answer: B

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116. The equation of the plane which passes through the point (2, 5, -8) and perpendicular to each of the planes 2x-3y+4z+1=0 and 4x+y-2z+6=0 is

A. x+10y+7z+4=0

B. x+2y+2z+4=0

C. 3x+2y+2z=0

D. x+10y+7z-4=0

Answer: A

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117. $\lim_{x \to \frac{\pi}{6}} \frac{\sin\left(x - \frac{\pi}{6}\right)}{\frac{\sqrt{3}}{2} - \cos x} =$

A. 0

B. 1

C. 2

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

Answer: C

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118. The integer 'n' is for which $Lt_{x \to 0} \frac{(\cos x - 1)(\cos x - e^x)}{x^n}$ is a finite non zero numberis

A. 4

B. 3

C. 2

D. 1

Answer: B

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119. If $f(x) = \int_{-1}^{x} |t| dt, x \geq 1$, then

A. f is continuous at x=0 but f' is not continuous

B. both f and f' are continuous for all $x > -1$

C. f is continuous for $x > -1$ but f' is not continuous

D. f and f' are differentiable at x=0

Answer: A

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120. If $x = \sinh^{-1}\left[\log\left(1+\sqrt{y}\right]\right., \text{ then } \frac{dy}{dx} =$

A. $2\left(y+\sqrt{y}\right)\sinh x$

B. $2\left(y+\sqrt{y}\right)\sqrt{1-\left(\log\left(1+\sqrt{y}\right)\right)^2}$

C. $2\left(y+\sqrt{y}\right)(\cosh x$

D. $2\left(y+\sqrt{y}\right)\log\left(1+\sqrt{y}\right)$

Answer: C

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121. If $f(x)=\frac{(7x+1)\sin x}{e^{x}\log x}$ and $f'(x)=f(x)g(x)$, then $g'(x)=$

A. $\frac{1}{x^{2}\log x}+\frac{1}{(x\log x)^{2}}-\cos ec^{2}x-\frac{49}{(7x+1)^{2}}$

B. $\frac{1}{x^{2}\log x}+\frac{1}{\log x}-\cos ec^{2}x-\frac{49}{(7x+1)^{2}}$

C. $\frac{1}{(x\log x)^{2}}+\frac{1}{\log x}-\cos ec^{2}x-\frac{49}{(7x+1)^{2}}$

D. $\frac{1}{x^{\square}}\left(x^{2}\log x\right)x+\frac{1}{(x\log x)^{2}}+\cos ec^{2}x+\frac{49}{(7x+1)^{2}}$

Answer: A

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122. If $f(x) = \begin{vmatrix} \cos x & 1 & 0 \\ 1 & 2\cos x & 1 \\ 0 & 1 & 2\cos x \end{vmatrix}$ then $\int_0^{\pi/2} f(x)dx =$

A. $\cos 3x$

B. $\cos(\pi + 3x)$

C. $\sin 3x$

D. $\sin(\pi + 3x)$

Answer: B

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123. The angle between the curves $y^2 = 8(x+4)$ and $y^2 = 24(4-x)$ is

A. $\tan^{-1}\left(\frac{1}{6}\right)$

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

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

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

Answer: C

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124. The function $f(x) = x^{1/x}$ for $x > 0$, is

A. increasing in $(1, \infty)$

B. $decrea\sin g \in$ (1, infty)`

C. increasing in $(1, \theta)$ and decreasing in (θ, ∞)

D. decreasing in $(1, \theta)$ and increasing in (θ, ∞)

Answer: C

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125. Let $f:\left[0,\frac{1}{2}\right]\rightarrow R$ be given by $f(x)=x(x-1)(x-2)$. The value 'c', when Lagrange's mean-value theorem is applied for f(x), is

A. $\frac{\sqrt{21}}{6}$

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

C. $1-\frac{\sqrt{21}}{6}$

D. $1\pm\frac{\sqrt{21}}{6}$

Answer: D

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126. If a tangent to the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1(a>b>0)$ having slope $\frac{1}{3}$ is a normal to the circle $x^2+y^2+2x+2y+1=0$, then the maximum value of ab is

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

B. 9

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

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

Answer: A

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127. $\int \frac{\sin^8 x - \cos^8 x}{1 - 2\sin^2 x + 2\sin^4 x}$dx $=$

A. $-\frac{1}{2}\sin 2x + c$

B. $-\sin 2x + c$

C. $\frac{1}{2}\sin 2x + c$

D. $\sin 2x + c$

Answer: A

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128. $\int \frac{2x^{12}+5x^9}{(x^5+x^3+1)^3}dx = \frac{x^p}{q(x^5+x^3+1)^r}+c$, then $p-q-r$=

A. $\frac{x^8}{)}(1+x^3+x^5)^2+c$

B. $\frac{x^{10}}{(1+x^3+x^5)^2}+c$

C. $\frac{x^{10}}{2(1+x^3+x^5)^2}$

D. $\frac{x^8}{2(1+x^3+x^5)^2}+c$

Answer: C

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129. $\int \frac{x^2+\cos^2 x}{(1+x^2)\sin^2 x}dx =$

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

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

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

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

Answer: D

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130. If

$$I_n = \int \sin^n x dx, \quad \text{for} \quad n = 1, 2, 3... \quad \text{then} \quad 8I_8 + 7(I_7 - I_6) - 6I_5 =$$

A. $-\sin^6 x \cos x(1 + \sin x) + c$

B. $\sin^8 x \cos x + \sin^5 x \cos x + c$

C. $-\sin^7 x \cos x(1 - \sin x) + c$

D. $-\cos^7 x \sin x(1 + \cos x) + c$

Answer: A

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131. $\lim_{n \to \infty} \frac{1 + 32 + 243 + \ldots + n^5}{n^6} =$

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

B. $\frac{1}{11}$

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

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

Answer: C

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132. Let $a > 1$ and $b > 1$. If f(t) is a periodic function of period T and $\int_0^{\infty} a^{-bi} f(t) dt = k \int_0^T a^{-bt} f(t) dt$ then k =

A. $\frac{a^{bT}}{T+1}$

B. $\frac{a^{-bT}}{a^{-bT}+1}$

C. $\frac{a^{bT}}{b^{aT}+1}$

D. $\frac{a^{bT}}{a^{bT}-1}$

Answer: D

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133. The area (in sq units) enclosed by the curves $y = \sin x + \cos x$ and $y = |\cos x - \sin x|$ over the interval $\left[0, \frac{\pi}{2}\right]$ is

A. $4 + 2\sqrt{2}$

B. $4 - 2\sqrt{2}$

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

D. $6 - 3\sqrt{2}$

Answer: B

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134. The degree and order respectively of the differential equation of the family of the curves respresented by $y = \sqrt{c(x + \sqrt{c})}$ are (Here, C is a parameter)

A. A 1, 3

B. B 2, 3

C. C 3, 1

D. D 2, 2

Answer: C

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135. The solution of the differential equation $\frac{x+y-1}{x+y-2}\frac{dy}{dx} = \frac{x+y+1}{x+y+2}$, given that y = 1 when x = 1, is

A. $2(y-x) + \log\left|\frac{(x+y)^2 - 2}{2}\right| = 0$

B. $\log\left|\frac{(x+y)^2 - 2}{2}\right| = (x-y)^2$

C. $\log\left|\frac{(x-y)^2 + 2}{2}\right| + 2(y-x) = 0$

D. $(x-y) + \log\left|\frac{(x+y)^2 - 2}{2}\right| = 0$

Answer: A

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