MATHS

BOOKS - TS EAMCET PREVIOUS YEAR PAPERS

AP EAMCET ENGINEERING ENTRANCE EXAM QUESTION PAPER 2017 (SOLVED)

Mathematics

1. In $\Delta ABC, \quad \text{if} \quad b\cos\theta = c - a$ (where θ is an acute angle) , then (c - a) tan $\theta =$

A. $2\sqrt{ca}\cos\frac{B}{2}$

B. $2\sqrt{ca}\sin\frac{B}{2}$

C. $2ca\cos\frac{B}{2}$

D. $2ca\sin\frac{B}{2}$

Answer: B

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2. Given below. Is the distribution of a random variable X

$X = x$	1	2	3	4
p(X=x)	λ	2λ	3λ	4λ

If $\alpha = P(X < 3)$ and $\beta = P(X > 2)$, then $\alpha : \beta =$

A. $2 : 5$

B. $3 : 4$

C. $4 : 5$

D. $3 : 7$

Answer: D

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3. If $f: IR \to IR$ is defined by

$$f(x) = \begin{cases} \text{x - 1}, & \text{for } x \leq 1 \\ 2 - x^2, & \text{for } 1 < x \leq 3 \\ \text{X - 10}, & \text{for } 3 < x < 5 \\ \text{2x}, & \text{for } x \geq 5 \end{cases}$$

then the set points of discontinuity of f is

A. IR - {1,5}

B. {1,3,5}

C. {1,5}

D. IR - {1,3,5}

Answer: C

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4. If the pair of lines $x^2 - 16pxy - y^2 = 0$ and $x^2 - 16qxy - y^2 = 0$ are such that each pair bisects the angle between the other pair, then qp =

A. $\frac{-1}{64}$

B. $\frac{1}{64}$

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

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

Answer: A

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5. If a non-zero vector a is parallel to the line of intersection of the plane determined by the vectors $\hat{j}-\hat{k}, 3\hat{j}-2\hat{k}$ and the plane determined by the vectors $2\hat{i}+3\hat{j}, \hat{i}-3\hat{j}$, then the angle between the vectors a and $\hat{i}+\hat{j}+\hat{k}$ is

A. $\sin^{-1}\left(\frac{2}{\sqrt{3}}\right)$

B. $\cos^{-1}\left(\pm\frac{2}{\sqrt{3}}\right)$

C. $\tan^{-1}\sqrt{3}$

D. $\cos^{-1}\left(\pm\frac{1}{\sqrt{3}}\right)$

Answer: D

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6. If three number are drawn at random successively without replacement from a set S = {1, 2, ... 10}, then the probability that the minimum of the chosen number is 3 or their maximum is 7 .

A. $\frac{11}{40}$

B. $\frac{5}{40}$

C. $\frac{3}{40}$

D. $\frac{1}{40}$

Answer: A

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7. for $x^2 - 4 \neq 0$, the value of

$$\frac{d}{dx}\left[\log\left\{e^x\left(\frac{x-2}{x+2}\right)^{3/4}\right\}\right] atx = 3is$$

A. $\frac{8}{5}$

B. 2

C. 1

D. $\frac{8e^3}{5}$

Answer: A

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8. If $y = \frac{\sinh^{-1} x}{\sqrt{1+x^2}}$ then $(1+x^2)y_2 + 3xy_1 + y =$

A. 2

B. 1

C. -1

D. 0

Answer: D

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9. The area enclosed between the curves $y^2 = x$ and $y = |x|$ is

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

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

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

D. 1

Answer: C

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

A. $\frac{13}{2\sqrt{2}}\log\left|\frac{\sqrt{2}-x}{\sqrt{2}+x}\right|+\frac{3}{2x}+C$

B. $\frac{13}{4\sqrt{2}}\log\left|\frac{x+\sqrt{2}}{x-\sqrt{2}}\right|+\frac{3}{2x}+C$

C. $\frac{13}{4\sqrt{2}}\log\left|\frac{x-\sqrt{2}}{x+\sqrt{2}}\right|+\frac{3}{2x}+C$

D. $\frac{5}{3\sqrt{2}}\log\left|\frac{x+2\sqrt{2}}{x-\sqrt{2}}\right|+\frac{3}{5}x+C$

Answer: C

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11. If $y=\tan^{-1}\left\{\frac{x}{1+\sqrt{1-x^2}}\right\}$ $+\sin\left\{2\tan^{-1}\sqrt{\frac{1-x}{1+x}}\right\}$, then $\frac{dy}{dx}=$

A. $\frac{1-2x}{2\sqrt{1-x^2}}$

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

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

D. $\frac{2-x}{2\sqrt{1-x^2}}$

Answer: A

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12. The equation of the plane through (4, 4, 0) and perpendicular to the planes

$2x + y + 2z + 3 = 0$ and $3x + 3y + 2z - 8 = 0$

A. $4x + 3y + 3z = 28$

B. $4x - 2y - 3z = 8$

C. $4x + 2y + 3z = 24$

D. $4x + 2y - 3z = 24$

Answer: B

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13. $\lim_{n \to \infty} \left[\frac{1^k + 2^k + 3^k + \ldots . + n^k}{n^{k+1}} \right] =$

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

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

C. $\frac{1}{k+1}$

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

Answer: C

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14. The coefficient of x^5 in the expansion of $(1+x)^{21} + (1+x)^{22} + \ldots + (1+x)^{30}$ is

A. $.^{31C_6 -} {}^{21}C_6$

B. $.^{51}C_5$

C. $.^{9}C_5$

D. $.^{30}C_5 + ^{20}C_5$

Answer: A

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15. Let A = { - 4, - 2, -1, 0, 3, 5} and $f: A \rightarrow IR$ be defined by

$$f(x) = \begin{cases} 3x - 1 & \text{for} \quad x > 3 \\ x^2 + 1 & \text{for} \quad -3 \le x \le 3 \\ 2x - 3 & \text{for} \quad x < -3 \end{cases}$$

Then the range of f is

A. { - 11, 5, 2, 1, 10, 14}

B. {- 11, -7, 2, 1, 8, 14}

C. {- 11, 5, 2, 1, 8, 14}

D. {-11, -7, -5, 1, 10, 14}

Answer: A

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16. Find the incenter of the triangle formed by the straight lines $y = \sqrt{3}x,\ y = -\sqrt{3}x$ and $y = 3$

A. (0,2)

B. (1,2)

C. (2,0)

D. (2,1)

Answer: A

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17. The solution of the equation $\left(x - 4y^3\right)\dfrac{dy}{dx} - y = 0,\ (y > 0)$ is

A. $x = y^3 + cy$

B. $x + 2y^3 = cy$

C. $y = x^3 + cx$

D. $y = 2x^3 = cx$

Answer: B

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18. If a circle with radius 2.5 units passes through the point (2,3) and (5,7) , then its centre is

A. (1,5,2)

B. (7,10)

C. (3,4)

D. (3.5,5)

Answer: D

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19. The circumcenter of the triangle formed by the point (1,2,3) (3,-1,5), (4,0,-3) is

A. (1,1,1)

B. (2,2,2)

C. (3,3,3)

D. $\left(\frac{7}{2}, \frac{-1}{2}, 1\right)$

Answer: D

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20. A bag P contains 5 white marbles and 3 black marbles. Four marbles are drawn at random form P and are put in an empty bag Q . If a marble drawn at rnadom from Q is found to be black then the probabiity that all the three black marbles in P are transfered to the bag Q is

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

B. $\frac{6}{7}$

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

D. $\frac{7}{8}$

Answer: A

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21. $\operatorname{sech}^{-1}\left(\frac{1}{\sqrt{2}}\right) + \cos ech^{-1}(-1) =$

A. 0

B. $\sqrt{2}+1$

C. $\sqrt{2}$

D. $\sqrt{2}-1$

Answer: A

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22. If the points whose position vectors are $3\bar{i} - 2\bar{j} - \bar{k}, 2\bar{i} + 3\bar{j} - 4\bar{k}, -\bar{i} + \bar{j} + 2\bar{k}, 4\bar{i} + 5\bar{j} + \lambda\bar{k}$ are coplanar, then show that $\lambda = -\frac{146}{17}$.

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

B. 8

C. -8

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

Answer: A

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23. The lines $y = 2x + \sqrt{76}$ and $2y + x = 8$ touch the ellips $\frac{x^2}{16} + \frac{y^2}{12} = 1$. If the point of intersection of these two lines lie on a circle. Whose centre coincides with the centre of that ellipse, then the equation of that circle is

A. $x^2 + y^2 = 28$

B. $x^2 + y^2 = 16$

C. $x^2 + y^2 = 12$

D. $x^2 + y^2 = (4 + \sqrt{8})^2$

Answer: A

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24. The equation of the pair of lines through the point (2,1) and perpendicular to the pair of lines 4xy + 2x + 6y + 3 = 0 is

A. xy - x - 2y + 2 = 0

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

C. xy - x + 2y - 6 = 0

D. xy - x + 2y - 2 = 0

Answer: A

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25. The harmonic mean of two numbers is $-\frac{8}{5}$ and their geometric mean is 2 . The quadratic equation whose roots are twice those numbers is

A. $x^2+5x+4=0$

B. $x^2+10x+16=0$

C. $x^2-10x+16=0$

D. $x^2-5x+4=0$

Answer: B

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26. If z is a complex number with $|z| \geq 5$. Then the least value of $\left|z+\frac{2}{z}\right|$ is

A. $\frac{24}{5}$

B. $\frac{26}{5}$

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

D. $\frac{29}{5}$

Answer: C

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27. ΔABC is formed by a (1,8,4), B (0, -11,4) and C(2,-3,1) . If D is the foot of the perpendicular from A to BC . Then the coordinates of D are

A. (-4,5,2)

B. (4,5,-2)

C. (4,-5,2)

D. (4,-5,-2)

Answer: B

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28. For the function f(x) = (x-1) (x-2) difined on $\left[0, \frac{1}{2}\right]$, the value of c satisfying Lagrange's mean value theorem is

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

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

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

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

Answer: D

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29. A container is the shape of an inverted cone. Its height is 6m and radius is 4 m at the top. If it is filled with water at the rate $3m^3 / \min$

then the rate of change of height of water (in mt//min) when the water level is 3 m is

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

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

C. 16π

D. 2π

Answer: A

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30. If the roots of the equation $x^3 - 7x^2 + 14x - 8 = 0$ are in geometric progression, then the difference between the largest and the smallest roots is

A. 4

B. 2

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

D. 3

Answer: D

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31. If the mean and variance of a binomial variate X are $\frac{4}{3}, \frac{8}{9}$ respectively , then P(X = 2) =

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

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

C. $\frac{8}{27}$

D. $\frac{8}{81}$

Answer: C

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32. If α is a non-real root of $x^7 = 1$ then $\alpha(1+\alpha)(1+\alpha^2+\alpha^4) =$

A. 1

B. 2

C. -1

D. -2

Answer: C

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33. If cot $(\cos^{-1} x) = \sec\left\{\tan^{-1}\left(\frac{a}{\sqrt{b^2-a^2}}\right)\right\} : b > a,$

then x =

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

B. $\frac{\sqrt{a^2-a^2}}{ab}$

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

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

Answer: A

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34. In $\Delta ABC, L, M, N$ are points on BC, CA, AB respectively , dividing them in the ration 1 : 2 , 2 : 3, 3 : 5 . If the point K divides AB in the ratio 5 : 3 , then $\frac{\left|\overline{AL} + \overline{BM} + \overline{CN}\right|}{\left|\overline{CH}\right|} =$

A. $\frac{5}{8}$

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

C. $\frac{3}{5}$

D. $\frac{1}{15}$

Answer: D

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35. The point to which the orgine is to be shifted to remove the first degree terms from the equation $2x^2 + 4xy - 6y^2 + 2x + 8y + 1 = 0$ is

A. $\left(\frac{7}{8}, \frac{3}{8}\right)$

B. $\left(\frac{-7}{8}, \frac{-3}{8}\right)$

C. $\left(\frac{-7}{8}, \frac{3}{8}\right)$

D. $\left(\frac{7}{8}, \frac{-3}{8}\right)$

Answer: C

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36. If α, β, γ are the lengths of the tangents from the vertices of a triangle to its incircle. Then

A. $\alpha + \beta + \gamma = \frac{1}{r^2}(\alpha\beta\gamma)$

B. $\frac{1}{\alpha} + \frac{1}{\beta} + \frac{1}{\gamma} = r(\alpha\beta\gamma)$

C. $\alpha+\beta+\gamma=\frac{1}{r}(\alpha\beta\gamma)$

D. $\alpha^2+\beta^2+\gamma^2=\frac{2}{r}(\alpha\beta\gamma)$

Answer: A

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37. If $\int_0^{10} f(x)dx=5 \text{then} \sum_{k=1}^{10}\int_0^1 f(k-1+x)dx=$

A. 50

B. 10

C. 5

D. 20

Answer: C

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38. The angle between the tangents drawn from the point (1,2) to the ellipse $3x^2 + 2y^2 - 5$ is

A. $\tan^{-1}\left(\frac{12\sqrt{5}}{5}\right)$

B. $\tan^{-1}\left(\frac{12\sqrt{5}}{13}\right)$

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

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

Answer: A

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39. If lx+ my = 1 is a normal to the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1, \text{then} a^2m^2 - b^2l^2 =$

A. $\frac{m^2}{l^2}(a^2 + b^2)^2$

B. $(l^2 + m^2)(a^2 + b^2)^2$

C. $\frac{l^2}{m^2}(a^2 + b^2)^2$

D. $l^2 m^2 (a^2 + b^2)^2$

Answer: D

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40. $\int \frac{x^{e-1} + e^{x-1}}{x^e + e^x} dx =$

A. $\frac{-1}{e} \log|x^e + e^x| + C$

B. $-e \log|x^e + e^x| + C$

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

D. $e \log|x^e + e^x| + C$

Answer: C

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41. $If\Delta = \begin{vmatrix} 1 & \cos\theta & 1 \\ -\cos\theta & 1 & \cos\theta \\ -1 & -\cos\theta & 1 \end{vmatrix}, then \Delta \text{lies in}$

the intervail

A. [2,4]

B. (2,4)

C. [1,4]

D. [-1,1]

Answer: A

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

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

$x^2 + y^2 + 4x + 6y + 6 = 0$ is

A. $10x^2 + 10y^2 + 18x + 16y + 5 = 0$

B. $3x^2 + 3y^2 - 3x + 6y - 8 = 0$

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

D. $x^2 + y^2 - x + 2y + 4 = 0$

Answer: A

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43. $\frac{x-1}{3x+4} < \frac{x-3}{3x-2}$ holds. for all x in the interval

A. $\left(\frac{-4}{3}, \frac{2}{3}\right)$

B. $\left(-\infty, \frac{-5}{4}\right)$

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

D. $\left(-\infty, \frac{-5}{4}\right) \cup \left(\frac{3}{4}, -\infty\right)$

Answer: A

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44. There are 10 intermediate stations on a railway line between two particular stations. The number of ways that a train can be made to stop at 3 of these intermediate stations so that no two of these halting stations are consecutive is

A. 56

B. 20

C. 126

D. 120

Answer: A

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45. The figure formed by the pairs of lines $6x^2 + 13xy + 6y^2 = 0$ and $6x^2 + 13xy + 6y^2 + 10x + 10y + 4 = 0$ is a

A. Square

B. Parallelogram

C. Rhombus

D. Rectangle

Answer: C

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46. If the point of intersection of the tangents drawn at the points where the line 5x + y + 1= 0 cuts the circle $x^2 + y^2 - 2x - 6y - 8 = 0$ is (a,b) , then 5a + b =

A. 3

B. -44

C. -1

D. 4

Answer: B

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47. If a, b and c are non-zero vectors such that a and b not perpendicular to each other, then the vector r which is perpendicular to a and satisfying $r \times b = c \times b$ is

A. $\dfrac{(a \times b) \times c}{c.\ a}$

B. $\dfrac{b \times (a \times c)}{b.\ c}$

C. $\dfrac{(b \times c) \times a}{a.\ b}$

D. $\dfrac{(c \times b) \times a}{a.\ c}$

Answer: C

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48. The tangents ot the parabola $y^2 = 4ax$ from an external point P make angles $\theta_1 \theta_2$ with the axis of the parabola . Such that tan $\theta_1 + \tan \theta_2$ = b where b is constant . Then P lies on

A. y = x +b

B. y + x = b

C. $y = \frac{x}{b}$

D. y = bx

Answer: D

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49. Find the points on the line $3x - 4y - 1 = 0$ which are at a distance of 5 units from the point (3,2).

A. $\left(-2, -\frac{7}{4}\right), \left(-3, \frac{-5}{2}\right)$

B. $\left(4, \frac{11}{4}\right), (-1, -1)$

C. $\left(1, \frac{1}{2}\right), \left(2, \frac{5}{4}\right)$

D. $(7, 5), (-1, -1)$

Answer: D

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50. $\underset{x \to 0}{\text{Lt}} \frac{(1-\cos 2x)(3+\cos x)}{x \tan 4x}\Big)$ is equal to

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

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

C. 1

D. 2

Answer: D

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51. The angle between the curves $x^2 + y^2 = 4$ and $x^2 = 3y$ is

A. $\tan^{-1}\frac{5}{\sqrt{3}}$

B. $\tan^{-1}\sqrt{\frac{5}{3}}$

C. $\tan^{-1}\frac{2}{\sqrt{3}}$

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

Answer: A

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52. If a, b, c are non-zero real numbers and if the equations (a-1) x = y +z, (b-1) y = z + x , (c - 1) z = x + y have a non-trival solution, then ab+bc+ca=

A. $a^2b^2c^2$

B. 0

C. abc

D. a + b+ c

Answer: C

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53. The number of different of preparing a garland using 6 distiuct white roses and 5 distinct red roses such that no two red roses come together is

A. 21600

B. 43200

C. 86400

D. 151200

Answer: B

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54. If a cylindrical vessel of given volume V with non lid on the top is to be made from a sheet of metal, then the radius (r) and height (h) of the vessel so that the metal sheet used is minimum is

A. $r = 3\sqrt{\frac{\pi}{V}}, h = 3\sqrt{\frac{\pi}{V}}$

B. $r = \sqrt{\pi V}, h = \sqrt{\pi V}$

C. $r = 3\sqrt{\frac{V}{\pi}}, h = 3\sqrt{\frac{V}{\pi}}$

D. $r = \sqrt{\frac{V}{\pi}}, h = \sqrt{\frac{V}{\pi}}$

Answer: C

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55. $\int \frac{x + \sin x}{1 + \cos x} dx =$

A. $x \tan \frac{x}{2} + C$

B. $x \text{sion} \frac{x}{2} + \cos \frac{x}{2} + C$

C. $x\tan\frac{x}{2}+\sec\frac{x}{2}+C$

D. $x\sec\frac{x}{2}+\tan\frac{x}{2}+C$

Answer: A

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56. If $I_n=\int\frac{\sin nx}{\cos x}dx$, then $I_n=$

A. $\frac{-2}{n-1}\cos(n-1)x-l_{n-2}$

B. $\frac{2}{n-1}\cos(n-1)x+l_{n-2}$

C. $\frac{-2}{n+1}\sin(n+1)x-l_{n-2}$

D. $\frac{-2}{n+1}\cos(n-1)x-l_{n-2}$

Answer: A

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57. If tan α and $\tan \beta$ are the roots of the equation $x^2 + px + q = 0$, then the value of $\sin^2(\alpha + \beta) + p\cos(\alpha + \beta)\sin(\alpha + \beta) + q\cos^2(\alpha + \beta)$ is

A. p + q

B. p

C. q

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

Answer: C

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58. If ω is a complex cube root of unity , then for any $n > 1 \sum_{r=1}^{n-1} r(r+1-\omega)\left(r+1-\omega^2\right] =$

A. $\frac{n^2(n+1)^2}{4}$

B. $\dfrac{n(n+1)(2n+1)}{6}$

C. $\dfrac{n(n-1)}{4}\left(n^2+3n+4\right)$

D. $\dfrac{n(n+1)(2n+1)}{4}$

Answer: C

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59. Let N be the set of all natural number , Z be the set of all integers and $\sigma : N \to Z$ be difined by

$$\sigma(n) = \begin{cases} \frac{n}{2}, & \text{if} \quad n \text{ is even} \\ & \qquad\qquad \text{then} \\ -\frac{n-1}{2}, & \text{if} \quad n \text{ is odd} \end{cases}$$

A. σ is onto not one-one

B. σ is one -one but not one

C. $signa$ is neither one-one nor onto

D. σ is one -one and onto

Answer: D

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60. $.^{37}C_4 + \sum_{r=1}^{5} (42-r)_{C_3} =$

A. $.^{41}C_4$

B. $.^{39}C_4$

C. $.^{36}C_4$

D. $.^{42}C_4$

Answer: D

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61. The variance of the following date is

x_1	6	10	14	18	24	28	30
f_1	2	4	7	12	8	4	3

A. 33.4

B. 34.3

C. 43.4

D. 44.3

Answer: C

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62. The differential equation corresponding to the family of circles in the plane touching the Y-axis at the origin is

A. $\frac{dy}{dx} = \frac{y^2 - x^2}{2xy}$

B. $\frac{dy}{dx} = \frac{2xy}{x^2 + y^2}$

C. $\frac{dy}{dx} = \frac{x^2 - y^2}{2xy}$

D. $\frac{dy}{dx} = \frac{x^2 + y^2}{2xy}$

Answer: A

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63. $p, x_1, x_2, \dots x_n$ and $q, y_1, y_2, \dots, y_n$ are two arithmetic progressions with common differences a and b respectively. If α and β are the arithmetic means of $x_1, x_2, \dots . X_n,$ and $y_1, y_2, \dots . Y_n$ respectivley . then the locus of $p(\alpha, \beta)$ is

A. a(x - p) = b (y - q)

B. b(x - p) = a (y - q)

C. $\alpha(x - p) = \beta(y - q)$

D. $p(x - \alpha) = q(y - \beta)$

Answer: B

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64. If $\alpha \neq 0$ and mean deviation of the observations {kα}, for k = 1,2, ... 50 about its median is 50 , then $|\alpha|$ =

A. 4

B. 3

C. 2

D. 5

Answer: A

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65. If 2kx + 3y - 1 = 0 , 2x + y + 5 = 0 are conjugate lines with respect to the circle $x^2 + y^2 - 2x - 4y - 4 = 0$, t hen k =

A. 3

B. 4

C. 1

D. 2

Answer: C

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66. if $\frac{5x^2+2}{x^3+x}=\frac{A_1}{x}+\frac{A_2x+A_3}{x^2+1}, then(A_1, A_2, A_3)=$

A. (0,2,3)

B. (3,0,2)

C. (2,3,0)

D. (2,0,3)

Answer: C

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67. The sum of first n terms of $\frac{1}{2 \cdot 5} + \frac{1}{5 \cdot 8} + \frac{1}{8 \cdot 11} + \dots$ is

A. $\frac{3n}{2(3n+2)}$

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

C. $\frac{n}{2(3n+2)}$

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

Answer: C

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68. Find the equation of the parabola whose axis is parallel to X-axis and which passes through these points.

(-2,1),(1,2), and (-1,3)

A. $18y^2 - 12x - 21y - 21 = 0$

B. $5y^2 + 2x - 21y + 20 = 0$

C. $15y^2 + 12x - 11y + 20 = 0$

D. $25y^2 - 2x - 65y + 36 = 0$

Answer: B

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69. In $\Delta ABC, b\cos(C+\theta) + c\cos(B-\theta) =$

A. $a\cot\theta$

B. $a\cos\theta$

C. $a\tan\theta$

D. $a\sin\theta$

Answer: B

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70. The number of solution of the trigonometric equation $1 + \cos x . \cos 5x = \sin^2 x$ in $[0, 2\pi]$ is

A. 8

B. 12

C. 10

D. 6

Answer: C

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71. If α, β, γ are the roots of $x^3 + px^2 + qx + r = 0$, then the value of $(1 + \alpha^2)(1 + \beta^2)(1 + \gamma^2)$ is

A. $(r - p)^2 = (r - q)^2$

B. $(1 + p)^2 + (1 + q)^2$

C. $(r+p)^2+(q+1)^2$

D. $(r-p)^2+(q-1)^2$

Answer: D

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72. If a system of three linear equations is three unknowns, which is in the matrix equations from of AX = D is inconsistent then $\frac{\text{rank of A}}{\text{rank of} AD}$ is

A. Less then one

B. greater than or equal to one

C. One

D. greater than one

Answer: A

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73. The angle between the two circles , each passing through the centre of the other is

A. $\dfrac{2\pi}{3}$

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

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

D. π

Answer: A

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74. If $\log_{\frac{1}{\sqrt{3}}}\left\{\dfrac{|z|^2-|z|+1}{2+|z|}\right\} > -2$, then z lies inside

A. a triangle

B. an ellipse

C. a circle

D. a square

Answer: C

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75. A circle having centre at the origin passes through the three vertices of a n equilateral triangle the length of its median being 9 units. Then the equation of that circle is

A. $x^2 + y^2 = 9$

B. $x^2 + y^2 = 18$

C. $x^2 + y^2 = 36$

D. $x^2 + y^2 = 81$

Answer: C

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76. $1 + \cos 10^\circ + \cos 20^\circ + \cos 30^\circ$ =

A. $4\sin 10^\circ \sin 20^\circ \sin 30^\circ$

B. $4\cos 5^\circ \cos 10^\circ \cos 15^\circ$

C. $4\cos 10^\circ \cos 20^\circ \cos 30^\circ$

D. $4\sin 5^\circ \sin 10^\circ \sin 15^\circ$

Answer: B

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77. If the points (1, 2) and (3, 4) were to be on the same side of the line $3x - 5y + a = 0$ then

A. $\{x \in IR : x > 11\}$

B. $\{x \in IR : x > 11\} \cup \{x \in IR : x < 7\}$

C. $\{x \in IR : x < 7\}$

D. ϕ

Answer: B

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78. If $x = \frac{1 \cdot 3}{3 \cdot 6} + \frac{1 \cdot 3 \cdot 5}{3 \cdot 6 \cdot 9} + \frac{1 \cdot 3 \cdot 5 \cdot 7}{3 \cdot 6 \cdot 9 \cdot 12} + \dots$ to infinite terms, then $9x^2 + 24x =$

A. 31

B. 11

C. 41

D. 21

Answer: B

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79. The triad (x,y,z) of real number such that $\left(\hat{i}-\hat{j}+2\hat{k}\right)=\left(2\hat{i}+3\hat{j}-\hat{k}\right)x+\left(\hat{i}-2\hat{j}+2\hat{k}\right)y+\left(-2\hat{i}+\hat{j}-2\hat{k}\right)$ z is

A. (-,2,5,3)

B. (2,-5,3)

C. (2,5,3)

D. (2,5,-3)

Answer: C

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80. If the volume of the tetrahedron formed by the cotermionus edges a, b and c is 4, then the volume of the parallelopiped formed by the coterminous edges $a\times b, b\times c$ and $c\times a$ is

A. 576

B. 48

C. 16

D. 144

Answer: A

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