MATHS

BOOKS - TS EAMCET PREVIOUS YEAR PAPERS

AP EAMCET (ONLINE QUESTION PAPER 2018 SOLVED)

Mathematics

1. If f (x) is a polynomial function satisfying $f(x).\ f\left(\frac{1}{x}\right) = f(x) + f\left(\frac{1}{x}\right)$ and f(4) =257 then f(3) =

A. 28

B. 65

C. 82

D. 244

Answer: C

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2. The set of all real values of x for which the real valued function f(x)= $\left(1+\frac{1}{x}\right)^x$ is defined is

A. $(0, \infty)$

B. R - {0}

C. $(-\infty, -1) \cup (0, \infty)$

D. R - {0,-1}

Answer: C

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3. Let $S_n = \sum_{k=1}^{n} (-1)^{k-1}. K^2$ for $n \geq 1.$ Given that $S_{2n} = -n(2n+1)$ For n=1,2,3,$\cdots$then $S_n =$

A. -3003

B. 3003

C. -2926

D. 2926

Answer: B

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4. $\begin{vmatrix} 5 & -3 & 0 \\ -3 & 5 & 0 \\ 0 & 0 & 2 \end{vmatrix} =$

A. 9!

B. 6!

C. 8!

D. 32

Answer: D

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5. Let A = $\begin{bmatrix} 5 & -3 & 0 \\ -3 & 5 & 0 \\ 0 & 0 & 2 \end{bmatrix}$ X be a non zero matrix of order 3×1 and c be a real number . If $A^2X = cAx$ then number of distinct values of c is

A. 3

B. 2

C. 1

D. 0

Answer: B

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6. The system of equations $(\sin 3\theta)x - y + z = 0, (\cos 2\theta)x + 4y + 3z = 0, 2x + 7y + 7z = 0$ has non trivial solutions if

A. $\frac{(n+1)^{\pi}}{2}+(-1)^{n}\frac{\pi}{4}$ (here n is any integer)

B. $\frac{(n-1)^{\pi}}{2}+(-1)^{n}\frac{\pi}{4}$ (here n is any integer)

C. $\frac{n\pi}{2}+(-1)^{n}\frac{\pi}{6}$ (here n is any integer)

D. $n\pi+(-1)^{n}\frac{\pi}{6}$ (here n is any integer)

Answer: D

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7. The maximum value of the modulus of e^{z} on the set $\{z \in C / 0 \leq \operatorname{Re}(z) \leq 1, 0 \leq Im(z) \leq 1\}$ is

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

B. e

C. e+1

D. e^{2}

Answer: B

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8. IF Z $\neq \pm 1$ is a complex number and Arg $\left(\frac{Z-1}{Z+1}\right)=\frac{\pi}{4}$ then the locus of Z in the Arg and plane is

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

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

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

D. $x^2+y^2+2x+1=0$

Answer: A

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9. If $C_r={}^nC_r$, then $C_0+C_4+C_8+C_{12}+\cdots=$

A. $\dfrac{2^{\frac{n}{2}}\left[\sin\frac{n\pi}{4}+2^{\frac{n}{2}-1}\right]}{2}$

B. $2^{\frac{n}{2}}\sin\dfrac{n\pi}{2}$

C. $2^{n-1} \cos \frac{n\pi}{4}$

D. $\frac{2^{\frac{n}{2}}\left[\cos \frac{n\pi}{4} + 2^{\frac{n}{2}-1}\right]}{2}$

Answer: A

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10. One of the complex roots of the equation $x^{11} - x^6 - x^5 + 1$ =0 is

A. $\text{cis}\frac{3\pi}{5}$

B. $\text{cis}\frac{\pi}{3} + 1$

C. $\text{cis}\frac{5\pi}{6}$

D. $\text{cis}\frac{7\pi}{5}$

Answer: D

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11. If the quadratic equation $4^{\sec^2\alpha}.\, X^2 + 2x + \left(\beta^2 - \beta + \frac{1}{2}\right) = 0$ has real roots , then the value of $\cos^2\alpha + \cos^{-1}\beta$ is

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

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

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

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

Answer: B

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12. The sum of the non real root of $(P^2 + P - 3)(P^3 + P - 2) - 12 = 0$is

A. 1

B. -1

C. 6

D. -6

Answer: B

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13. The solution set of the inequation $\sqrt{x^2 + 6x + 5} > (8 - x)$ is

A. $(8, \infty)$

B. $\left(\frac{59}{22}, 8\right)$

C. $\left(\frac{59}{22}, \infty\right)$

D. $(-1, \infty)$

Answer: C

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14. The difference of the irrational roots of the equation $x^5 - 5x^4 + 9x^3 - 9x^2 + 5x - 1 = 0$ is

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

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

C. $\frac{1 \pm i\sqrt{3}}{2}$

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

Answer: A

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15. Let m be a natural number such that 2000 $< m <$ 60000 and let k be the sum of all the digits in m. Then the number of numbers m for which k is even is

A. 19909

B. 19989

C. 18999

D. 19999

Answer: D

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16. There are three sections in a question paper each containing 4 questions. If a candidate has to answer only 5 questions from this paper without leaving any sections then number of ways the candidate can make the choice of questions is

A. 624

B. 704

C. 384

D. 432

Answer: A

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17. The coefficient of x^4 in the expansion of $\left(1+x-x^2-x^3\right)^{11}$ is

A. 990

B. 220

C. -220

D. -385

Answer: C

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18. If |x| is so small that x^2 and higher powers of x may be neglected then the approximate value of $\dfrac{\sqrt{4+x}+\sqrt[3]{8-x}}{\left(1-\frac{2x}{3}\right)^{\frac{3}{2}}}$ when x = $\dfrac{6}{25}$ is

A. 6

B. 5

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

D. $\frac{5}{6}$

Answer: B

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19. The coefficient of x^4 in the power series expansion of $\frac{x^2-1}{(x^2+1)(x^2+2)}$ is

A. $\frac{15}{16}$

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

C. $-\frac{13}{8}$

D. $\frac{77}{324}$

Answer: C

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20. The smallest positive root of the equation tan x-x =0 lies in the interval

A. $\left(0, \frac{\pi}{2}\right)$

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

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

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

Answer: C

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21.

$$\left(1+\cos\frac{\pi}{8}\right)\left(1+\cos\frac{2\pi}{8}\right)\left(1+\cos\frac{3\pi}{8}\right)\left(1+\cos\frac{4\pi}{8}\right)\left(1+\cos\frac{5\pi}{8}\right)\left(1$$

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

B. $\frac{1}{16}$

C. $\frac{1}{32}$

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

Answer: B

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22. If A is in the third quadrant and tan A = $\frac{\sqrt{7}}{3}$ then 18 - 16 $\sin^2$ ^ $\frac{A}{2} - 32\sin\frac{A}{2}\sin\frac{5A}{2}$ =

A. -6

B. 11

C. 5

D. 10

Answer: B

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23. Let P(α, β) and $Q(\gamma, \delta)$ be two points that lie on the curve $\tan^2(x+y)+\cos^2(x+y)+y^2+2y=0$ in the XY - plane . If the distance between P and Q is d then cos d=

A. 0

B. $(-1)^n, n \in N$

C. $\pm\pi$

D. $\pm 2n\pi, n \in N$

Answer: B

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24. $\tan^{-1}2+\cot^{-1}(-3)+\cot^{-1}\frac{1}{3}+\tan^{-1}\left(-\frac{1}{2}\right)$ =

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

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

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

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

Answer: D

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25. If $x = -\frac{1}{2}\sin h^{-1}x + \cos ech^{-1}x$ =

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

B. $\log_e\left(\frac{3+\sqrt{5}}{2}\right)$

C. $\log_e\left[\frac{\left(\sqrt{5}-1\right)\left(2+\sqrt{3}\right)}{2}\right]$

D. $\log_e\left[\frac{\left(\sqrt{5}+1\right)\left(2+\sqrt{3}\right)}{2}\right]$

Answer: A

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26. In ΔABC if $\frac{s-a}{11}=\frac{s-b}{12}=\frac{s-c}{13}$ then $\tan^3\left(\frac{A}{3}\right)+\tan^2\left(\frac{C}{2}\right)=$

A. $\frac{290}{429}$

B. $\frac{290}{143}$

C. $\frac{143}{33}$

D. $\frac{113}{33}$

Answer: A

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27. In ΔABC ,

$(a-b)^2\sin^2\left(\frac{A+B}{2}\right)+(a+b)^2\sin^2\left(\frac{C}{2}\right)$ =

A. b^2

B. a^2

C. c^2

D. $a^2 + b^2 - c^2$

Answer: C

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28. In a triangle if the ex-radii r_1, r_2, r_3 are in the ration $1:2:3$, then its sides are in the ratio

A. $5:8:9$

B. $5:4:3$

C. $7:9:11$

D. $1:2:3$

Answer: A

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29. In ΔABC if D and E are the mid-points of the sides BC and CA respectively then 2(AD+EB)=

A. 3AB

B. $\frac{3}{A}$AB

C. 2AB

D. 3BC

Answer: A

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30. If n = $2\hat{i} - 3\hat{i} + 4\hat{k}, m = \hat{i} - \hat{j}, I = 2\hat{i} - \hat{j} + \hat{k}$, then the Cartesian equation of the plane passing through the line of intersection of two planes r.n = 1 and r.m =-4 and perpendicular to the plane r.1= -8 is

A. 5x-20y-12z-44=0

B. x-2y-12z-45=0

C. 5x-20y-12z-47=0

D. 5x-2y-12z+47=0

Answer: D

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31. If a,b,c are vectors of equal magnitude such that (a,b)= α, (b,c)= β, (c,a)= γ, then the minimum value of cos $\alpha + \cos\beta + \cos\gamma$ is

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

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

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

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

Answer: B

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32. In ΔABC if A$(\alpha), B(\beta)\text{and}C(\gamma)$ are the position vectors of the vertices then the length of the perpendicular from A to BC is

A. $|\alpha \times \beta| + |\beta \times \gamma| + |\gamma \times \alpha|$

B. $|\alpha \times \beta + \beta \times \gamma + \gamma \times \alpha|$

C. $\dfrac{|\alpha \times \beta + \beta \times \gamma + \gamma \times \alpha|}{|\alpha - \beta|}$

D. $\dfrac{|\alpha \times \beta + \beta \times \gamma + \gamma \times \alpha|}{|\gamma - \beta|}$

Answer: D

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33. If a,b,c are three non-coplanar vectors then match the items of List -I with those of List -II.

	List-I		List-II
A.	[b × c c × a a × b] =	I.	$[a\ b\ c]^2$
B.	[a × b a × c b] =	II.	2 [a b c]
C.	[a + b b + c c + a] =	III.	[a b c]
D.	For three mutually perpendicular unit vectors a, b, c :	IV.	[a b c] [a · b]
		V.	0

The correct answer is

A. $(a)\ \begin{matrix} A & B & C & D \\ III & IV & V & II \end{matrix}$

B. $(a)\ \begin{matrix} A & B & C & D \\ IV & V & II & III \end{matrix}$

C. $(a)\ \begin{matrix} A & B & C & D \\ I & IV & V & III \end{matrix}$

D. $(a)\ \begin{matrix} A & B & C & D \\ I & IV & II & III \end{matrix}$

Answer: D

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34. a,b and c are three unit vectors such that no two of them are collinear.

If b=2 $\{a \times (b \times c)\}$ and α is the angle between a,c and β is the angle between a,c and β is the angle between a,b then cos $(\alpha + \beta)$ =

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

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

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

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

Answer: B

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35. If the variance of 4,7,8,9,10,11 is σ^2 then the variance of 12 14, 16,18,20,22 is

A. $2\sigma^2$

B. $4\sigma^4$

C. $100 + 2\sigma^2$

D. $100 + 4\sigma^2$

Answer: B

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36. Consider the frequency distribution

C.I.	75- 175	175-275	275-375	375-475	475-575	575-675	675-775
f_i	3	2	1	0	1	2	3

If the variance of this distribution is 60000, then the coefficient of variation of the distribution is

A. 60

B. $\frac{400\sqrt{6}}{17}$

C. $\frac{400\sqrt{6}}{9}$

D. 595.75

Answer: B

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37. If two numbers a and b are chosen from the set of integers 1 to 39 then the prodability that those numbers satisfy the equation 7a-9b=0 is

A. $\frac{1}{742}$

B. $\frac{4}{743}$

C. $\frac{4}{741}$

D. $\frac{5}{741}$

Answer: C

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38. Two balls are drawn from an urn containing 7 white 6 red and 8 black balls one after the other without replacement . Then the probability that atleast one of them is white is

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

B. $\frac{13}{30}$

C. $\frac{11}{30}$

D. $\frac{17}{30}$

Answer: D

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39. In a manufacturing company three machines A, B and C respectively produce 20%, 30% and 50% of the total product . The defictive products from A ,B and C are respectively 5% 3% and 2%. If an article produced by the company is selected at random and is found to be defective then the probability that it is produced by machine B is

A. $\frac{10}{29}$

B. $\frac{8}{29}$

C. $\frac{9}{29}$

D. $\frac{11}{29}$

Answer: C

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40. The variance of the random variable X having the following distribution

$X = k$	-2	-1	0	1	2
$P(X = k)$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{6}$

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

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

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

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

Answer: D

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41. Given that the probability of a man hitting a target with a gun is $\frac{1}{3}$. If he fires 8 times then the probability of his hitting the target atleast twice is

A. $5\left(\frac{2}{3}\right)^8$

B. $1-5\left(\frac{2}{3}\right)^8$

C. $\left(\frac{2}{3}\right)^8$

D. $\left(\frac{3}{8}\right)^4$

Answer: B

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42. A variable line 'L' Passing through the origin cuts two parallel lines x-y+10=0 and x-y+20=0 at two points A and B respectively . If P is a point on line 'L' such that OA , OP, OB are in harmonic progression then the locus of P is

A. 3x+3y+40=0

B. 3x+3y+20=0

C. 2x-3y+40=0

D. 3x-3y+20=0

Answer: C

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43. When the axes are rotated through an angle 45°, the transformed equation of a curve is $17x^2 - 16xy + 17y^2 = 225$. Find the original equation of the curve.

A. $25x^2 + 9y^2 = 225$

B. $9x^2 - 25y^2 = 225$

C. $25x^2 - 16xy + 9y^2 = 2251$

D. $9x^2 + 25y^2 = 225$

Answer: A

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44. The vertex A of a triangle lies on the lines x+y=1 and 2x+3y=6 . If the orthocentre of the triangle is O $\left(\frac{3}{7}, \frac{22}{7}\right)$ then the equation of OA in the normal form is

A. x cos$\alpha + y \sin \alpha = 7, \alpha = \frac{\tan^{-1}(1)}{7}$

B. $x \cos \alpha + y \sin \alpha = \frac{13}{\sqrt{17}}, \alpha = \tan^{-1}\left(\frac{1}{4}\right)$

C. $x \cos \alpha + y \sin \alpha = \frac{13}{4}, \alpha = \tan^{-1}\left(\frac{13}{\sqrt{17}}\right)$

D. $x \cos \alpha + y \sin \alpha = \frac{13}{\sqrt{17}}, \alpha = \tan^{-1}(4)$

Answer: D

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45. The equation of the line passing through the point of intersection of the lines 2x+3y+6=0, 3x-y-13 =0 and parallel to the line 3x-4y+5=0 is

A. 3x-4y+785=0

B. 3x-4y+15=0

C. 3x-4y+25=0

D. 3x-4y-25 =0

Answer: D

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46. If O,G , are respectively the orthocentre centroid and circumcentre of a orthocentre whose vertices are A(2,3) , B (2,4), then $AO^2 + 9BG^2 + 4CS^2$

A. $\frac{77}{36}$

B. 13

C. $\frac{8}{9}$

D. $\frac{5}{4}$

Answer: B

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47. IF two sides of a triangle are given by $3x^2 - 5xy + 2y^2$ =0 and its orthocentre (2,1), then the equation of the third side of the triangle is

A. 5x-10y+1=0

B. 10x+5y-1=0

C. 5x-10y=21

D. 10x+5y=21

Answer: D

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48. The equation of the pair of lines joining the origin to the points of intersection of two circles $x^2 + y^2 - 4x + 8y + 5 = 0$ and $x^2 + y^2 + 2x + 4y - 3 = 0$ is

A. A $13x^2 + 68xy - 28y^2 = 0$

B. B $xy - 28y^2 = 0$

C. C $(x + 4)(x - 5) = 0$

D. D $13x^2 + 68xy + 28y^2 = 0$

Answer: D

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49. If circle $x^2 + y^2 + 2gx + 2fy + c = 0 (c > 0)$ touches both the coordinate axes and lies in the third quadrant then the length of the chord intercepted by the circle on the line x+y+$\sqrt{c} = 0$ is

A. $\sqrt{2c}$

B. c

C. $\sqrt{c}$

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

Answer: A

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50. If the shortest distance from (2,-14) to the circle $x^2 + y^2 - 6x - 4y - 12 = 0$ is d and the length of the tangent drawn from the same point to the circle is l then $\sqrt{d + l}$ =

A. 13

B. $2\sqrt{5}$

C. 12

D. 5

Answer: B

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51. The number of common tangents to the circles $x^2+y^2-4x-2y+k$ =0 and $x^2+y^2-6x-4y+l$=0 having radii 2 and 3 respectively is

A. 4

B. 2

C. 3

D. 1

Answer: B

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52. The centre of the circle which intersects the circle $x^2+y^2-2x-2y-2=0$ orthogonally and passes through the point (2,0) and touches the X -axis is

A. (4,1)

B. (-1,2)

C. (1,4)

D. (2,-1)

Answer: D

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53. From any point on the circle $x^2 + y^2 + 2gx + 2fy + c = 0$ tangents are drawn to the circle $x^2 + y^2 + 2gx + 2fy + c\sin^2\alpha + (g^2 + f)\cos^2\alpha = 0.$ The angle between the tangents is

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

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

C. 2α

D. α

Answer: C

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54. If the double ordinate of the parabola $y^2 = 8x$ is of length 16 then the angle subtended by it at the vertex of the parabola is

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

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

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

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

Answer: A

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55. If P and the origin are the points of intersection of the parabolas $y^2 = 32x$ and $2x^2 = 27y$ and if θ is the acute angle between these curves at P then $5\sqrt{\tan\theta}$ =

A. 2

B. $2\sqrt{3}$

C. $3\sqrt{2}$

D. 3

Answer: C

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56. The latus rectum LL' subtends a right angle at the centre of the ellipse, then its eccentricity is

A. $\frac{\sqrt{5}+1}{4}$

B. $\frac{\sqrt{5}-1}{2}$

C. $\frac{\sqrt{10-2\sqrt{5}}}{5}$

D. $\frac{\sqrt{10+2\sqrt{5}}}{5}$

Answer: B

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57. If the tangent at the point (1,2) on the ellipse $3x^2 + 4y^2 = 19$ is also a tangent to the parabola $y^2 - kx = 0$ then k =

A. $\frac{57}{16}$

B. $\frac{-57}{64}$

C. $\frac{57}{64}$

D. $\frac{-57}{16}$

Answer: D

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58. The equation of one asymptote of the hyperbola $14x^2 + 38y + 20y^2 + x - 7y - 91 = 0$ is $7x + 5y - 3 = 0$. Then the other asymptote is

A. 2x-4y+1=0

B. 2x+4y+1=0

C. 2x-4y-1=0

D. 2x+4y-1=0

Answer: B

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59. If the mid-point of the sides AB,AC,CA of a triangle are (1,5,-1) , (0,4,-2), (2,3,4) respectively then the length of the median drawn from C to AB is

A. $\sqrt{29}$

B. $\sqrt{27}$

C. $\sqrt{5}$

D. 5

Answer: D

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60. If a line makes angles $\frac{\pi}{4}$ and $\frac{\pi}{3}$ with Y-axis and Z-axis respectively then the obtuse angle made by that line with X -axis is

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

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

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

D. $\frac{5\pi}{6}$

Answer: B

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61. The equation of the plane bisecting the line segment joining the points (2,0,6) and (-6,2,4) and perpendicular to it is

A. 2x-y+4z-15=0

B. `4x-y+3z-6=0

C. 4x-y+z+4=0

D. x-2y+3z-11=0

Answer: C

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62. $\lim_{x \to 0} \frac{\sqrt{1 + x\sin x} - \sqrt{\cos x}}{\tan^2 2x} =$

A. 3

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

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

D. $\frac{3}{16}$

Answer: D

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63. If the function f defined by

$$f(x)=\begin{cases}\cos x & \text{if} \quad x\le 0\\ 3x+\alpha & \text{if} \quad 0<x<2\\ \beta x+3 & \text{if} \quad 2\le x\le 4\\ 11 & \text{if} \quad x>4\end{cases}$$

where α and β real constants is continuous on R then $\alpha^2+\beta^2=$

A. 3

B. 9

C. 5

D. 1

Answer: C

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64. If $f:[0,3]\rightarrow[0,3]$ is defined by:

$f(x)=\begin{cases}1+x & 0\le x\le 2\\ 3-x & 2<x\le 3\end{cases}$, then show that $f[0,3]\subseteq[0,3]$ and find

fof.

A. Conrinuous at x = 1

B. Continuous at x =2

C. Discontinuous at x =1 and x=2

D. Continuous on [0,3]

Answer: C

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65. If f:R $\rightarrow$ R is a differentible function such that f(x+y) = f (x). F(y) for all x,y $\in$ R and if f'(4) =24 and f'(0) = 3 then f(4) =

A. 72

B. 5

C. 11

D. 8

Answer: D

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66. $\frac{d}{dx}\left[x^{\sin x}+(\sin x)^{x}\right]=$

A. $x^{\sin x}\left[\frac{\sin x}{x}+\cos x \log x\right]+(\sin x)^{x}[x \tan x+\log(\sin x)]$

B. $x^{\sin x}[x \tan x+\cos x \log x]+(\sin x)^{x}\left[\frac{\sin x}{x}+\log(\sin x)\right]$

C. $x^{\sin x}\left[\frac{x}{\sin x}+\cos x \log x\right]+(\sin x)^{x}[x \cot x+\log(\sin x)]$

D. $x^{\sin x}\left[\frac{\sin x}{x}+\sin x \log x\right]+(\sin x)^{x}[x \cot x+\log(\cos x)]$

Answer:

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67. If x =a (t+sint) and y=a (1-cost) then $\frac{d^2y}{dx^2}$

A. $\frac{1}{4a \sin^4\left(\frac{t}{2}\right)}$

B. $\frac{1}{4a\cos^4\left(\frac{t}{2}\right)}$

C. $4a\cos ec^4\left(\frac{t}{2}\right)$

D. $4a\sec^4\left(\frac{t}{2}\right)$

Answer: B

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68. Find the angle between the curves xy=2 and $x^2 + 4y = 0$

A. -1

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

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

D. 3

Answer: D

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69. If the function f(x) = $x^3 + 2px^2 + 27x + 16$ is stricly increasing for all x $\in$ R then the range of p is

A. $\left(-\infty, \frac{-9}{2}\right) \cup \left(\frac{9}{2}, \infty\right)$

B. $(-\infty, -9) \cup (9, \infty)$

C. $\left(\frac{-9}{2}, \frac{9}{2}\right)$

D. $(-9, 9)$

Answer: C

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70. If f(x) = $\sqrt{x}$ and g(x) $= \frac{1}{\sqrt{x}}$ for x $\in$ [3,12] then the value of c $\in$ (3,12) for which $\frac{f'(c)}{g'(c)} = \frac{f(12) - f(3)}{g(12) - g(3)}$ hold is

A. 7.5

B. 4.8

C. 6

D. 9

Answer: C

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71. If the distance s described in time t by a particle moving on a straight line is given by s $= t^5 - 40t^3 + 30t^2 + 80t - 250$ then its minimum acceleration is

A. 260

B. -260

C. 130

D. -130

Answer: B

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72. If $f\left(\frac{t+1}{2t+1}\right) = t+1$, then $\int f(x)dx =$

A. $\frac{x^2}{2} + c$

B. $\log_e(2x = -1) + \frac{1}{2}\log_e|(x+1)| + c$

C. $\frac{1}{2}\log_e\left|\left(\frac{x+1}{2x+1}\right)\right| + c$

D. $\frac{x}{2} + \frac{1}{4}\log_e|2x-1| + c$

Answer: D

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73. $\int \frac{x^8 - 9x^2 + 18}{x^4 - 3x^2 + 3} dx =$

A. $\frac{x^5}{4} + x^3 + 6x^2 + c$

B. $\frac{x^5}{5} + \frac{x^4}{4} + 6x + c$

C. $\frac{x^4}{5} + x^3 + 6x + c$

D. $\frac{x^5}{5} - \frac{x^3}{2} + 6x^2 + c$

Answer: C

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74. If $\int \frac{x^4+1}{x^6+1}dx = A\tan^{-1}x + B\tan^{-1}x^3 + c$, then (A,B) =

A. $\tan^{-1}(x^3) + \tan^{-1}x + c$

B. $\frac{1}{3}\tan^{-1}x + \tan^{-1}x^3 + c$

C. $3\tan^{-1}x^3 + \tan^{-1}x + c$

D. $\tan^{-1}x + \frac{1}{3}\tan^{-1}x^3 + c$

Answer: D

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75. $\int (\log x)^3 x^5 dx$=

A. $x^8\left[\frac{(\log x)^3}{12} - \frac{1}{2}(\log x)^2 + \frac{1}{6}\log x - \frac{1}{36}\right] + c$

B. $x^6\left[\frac{(\log x)^3}{6}-\frac{1}{18}(\log x)^2+\frac{\log x}{12}-\frac{1}{36}\right]+c$

C. $x^6\left[\frac{(\log x)^3}{6}+\frac{1}{12}(\log x)^2-\frac{\log x}{12}+\frac{1}{36}\right]+c$

D. $x^6\left[\frac{(\log x)^3}{6}-\frac{(\log x)^2}{12}+\frac{\log x}{36}-\frac{1}{216}\right]+c$

Answer: D

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76. Evaluate the limit .

$$\lim_{n\to 00}\left[\left(1+\frac{1}{n^2}\right)\left(1+\frac{2^2}{n^2}\right)\dots\dots\dots\left(1+\frac{n^2}{n^2}\right)\right]^{\frac{1}{n}}$$

A. $3e^{\frac{\pi-4}{6}}$

B. $2e^{\frac{\pi-2}{4}}$

C. $2e^{\frac{\pi-4}{2}}$

D. $4e^{\frac{\pi-4}{4}}$

Answer: C

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77. $\int_0^{\frac{\pi}{2}} \frac{\cos x dx}{\sqrt{1+\cos x \sin x}}$ =

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

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

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

D. $\sqrt{2} \sin^{-1}(\sqrt{3})$

Answer: C

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78. The area (in square units) bounded by the curves y= $2x^2$ and y = max {x-[x],x+|x|} in between the lines x =0 and x =2 is

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

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

C. 1

D. 2

Answer: D

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79. If a and b are arbitrary constants then the differential equation having $\frac{x^2}{a^2} + \frac{y^2}{b^2}$ =1 as its gengeral solution is

A. $\left(\frac{d^2y}{dx^2}\right)^2 = \left[1 + \left(\frac{dy}{dx}\right)^2\right]^3$

B. $(x^2 - y^2)\frac{d^2y}{dx^2} - 2xy\frac{dy}{dx} - y = 0$

C. $xy\frac{d^2y}{dx^2} + x\left(\frac{dy}{dx}\right)^2 - y\frac{dy}{dx} = 0$

D. $x^2\frac{d^2x}{dx^2} + 2x\frac{dy}{dx} - 2y = 0$

Answer: C

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80. The general solution of the differential equation $\frac{dx}{dy} + \frac{x}{y} = x^2$ is

A. $\frac{1}{y} = cx - y \log x$

B. $\frac{1}{x} = cy + x \log x$

C. $\frac{1}{x} = cy - y \log y$

D. $\frac{1}{y} = cx + y \log x$

Answer: C

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