MATHS

BOOKS - TS EAMCET PREVIOUS YEAR PAPERS

AP EAMCET SOLVED PAPER 2018 (23-04-2019,SHIFT -1)

Mathematics

1. When the coordinate axes are rotated by an angle $\tan^{-1}\left(\frac{3}{4}\right)$ about the origin, then the equation $x^2 + y^2 = 9$ is transformed to the equation.

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

B. $x^2 + y^2 + 2xy = 4$

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

D. $x^2 - y^2 + 9 = 0$

Answer: C

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2. If the lines $x + ay = a = 0, bx + y + b = 0, cx + cy + 1 = 0$ (a,b,c being distinct and $\neq 1$) are concurrent, then the value of $\left(\frac{a}{a-1} + \frac{b}{b-1} + \frac{c}{c-1}\right)$ is

A. 1

B. -1

C. 2

D. 0

Answer: A

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3. If $ad - bc \neq 0$, then the area (in sq. units) of the parallelogram formed by the lines $ax + by + 2 = 0$, $ax + by + 5 = 0$, $cx + dy + 3 = 0$ and $cx + dy + 7 = 0$ is

A. $\dfrac{1}{|ad - bc|}$

B. $\dfrac{5}{|ad - bc|}$

C. $\dfrac{7}{|ad - bc|}$

D. $\dfrac{12}{|ad - bc|}$

Answer: D

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4. The circumcentre of the triangle with vertices at $(-2, 3)$, $(1, -2)$ and $(2, 1)$ is

A. $\left(\dfrac{6}{7}, \dfrac{2}{7}\right)$

B. $\left(-\frac{6}{7}, \frac{2}{7}\right)$

C. $\left(\frac{6}{7}, -\frac{2}{7}\right)$

D. $\left(-\frac{6}{7}, -\frac{2}{7}\right)$

Answer: B

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5. If the straight line $2x + 3y + 1 = 0$ bisects the angle between a pair of lines, one of which in this pair is $3x + 2y + 4 = 0$, then the equation of the other line in that pair of lines is

A. $3x + 4y - 9 = 0$

B. $6x - 7y - 14 = 0$

C. $9x + 46y - 28 = 0$

D. $9x - 23y - 12 = 0$

Answer: C

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6. The area of the triangle formed by the straight line x + y = 3 and the angle bisectors of the pair of straight lines $x^2 - y^2 + 2y = 1$ is

A. 1

B. 2

C. 3

D. 6

Answer: B

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7. The product of the lengths of the perpendiculars drawn from the point $(-1, 5)$ to the pair of lines $2x^2 - xy - 3y^2 + 6x + y + 4 = 0$ is

A. $\frac{68}{\sqrt{2}}$

B. $\frac{68}{\sqrt{26}}$

C. $\frac{65}{\sqrt{2}}$

D. $\frac{65}{\sqrt{26}}$

Answer: D

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8. ABCD is a square with side 16 units and A is the origin. If the equation of the circle circumscribing the square ABCD is $x^2 + y^2 = 4k(x + y)$, then k=

A. 2

B. 4

C. 16

D. 64

Answer: B

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9. If a point P is moving such that the lengths of tangents drawn from P to the circles

$x^2 + y^2 - 4x - 6y - 12 = 0$ and

$x^2 + y^2 + 6x + 18y + 26 = 0$ are the ratio 2:3, then find the equation to the locus of P.

A. $x^2 + y^2 + 24x - 36y + 62 = 0$

B. $x^2 + y^2 - 24x + 36y + 62 = 0$

C. $x^2 + y^2 - 24x - 54y - 88 = 0$

D. $x^2 + y^2 + 24x + 36y + 62 = 0$

Answer:

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10. If the lines $2x + y + 12 = 0, kx - 3y - 10 = 0$ are conjugate with respect to the circle $x^2 + y^2 - 4x + 3y - 1 = 0$, then k =

A. 4

B. -9

C. -3

D. -5

Answer: A

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11. The length of the transverse common tangent of the circle $x^2 + y^2 - 2x + 4y + 4 = 0$ and $x^2 + y^2 + 4x - 2y + 1 = 0$ is

A. A $\sqrt{3}$

B. B $\sqrt{17}$

C. C $\sqrt{15}$

D. D 3

Answer: D

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12. If the angle between the circles

$x^2 + y^2 - 12x - 6y + 41 = 0$ and

$x^2 + y^2 + kx + 6y - 59 = 0$ is 45° find k.

A. 0

B. -4

C. -3

D. -1

Answer: B

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13. If the lengths of the tangents drawn from a point P to the three circles

$x^2 + y^2 - 4 = 0$, $x^2 + y^2 - 2x + 3y = 0$ and $x^2 + y^2 + 7y - 18 = 0$

are equal, then the coordinates of P are

A. (2,5)

B. (3,4)

C. (4,3)

D. (5,2)

Answer: D

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14. For the parabola $y^2 + 6y - 2x + 5 = 0$, match the items in List-I with the suitable item in List-II given below:

List-I	List-II
(I) Vertex	(A) $\left(-\frac{3}{2}, -3\right)$
(II) Focus	(B) $\left(\frac{3}{2}, -3\right)$
(III) Equation of the directrix	(C) $2x + 5 = 0$
(IV) Equation of the axis	(D) $2x + y + 3 = 0$
	(E) $y + 3 = 0$
	(F) $(-2, -3)$

The correct matching is

A. $\begin{matrix} I & II & III & IV \\ F & A & E & C \end{matrix}$

B. $\begin{matrix} I & II & III & IV \\ F & A & C & E \end{matrix}$

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

D. $\begin{matrix} I & II & III & IV \\ F & A & C & D \end{matrix}$

Answer: B

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15. If $5x - 2y + k = 0$ is a tangent to the parabola $y^2 = 6x$, then their point of contact is

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

B. $\left(\frac{6}{5}, \frac{6}{25}\right)$

C. $\left(\frac{6}{25}, \frac{6}{5}\right)$

D. $\left(\frac{6}{25}, \frac{6}{25}\right)$

Answer: C

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16. If the minor axis of an ellipse subtends an angle 90° at each focus then the eccentricity of the ellipse is

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

B. $\frac{\sqrt{7}}{4}$

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

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

Answer: C

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17. The points of intersection of the perpendicular tangents drawn to the ellipse $4x^2 + 9y^2 = 36$ lie on the curve.

A. $x^2 + y^2 = 13$

B. $x^2 - y^2 = 5$

C. $x + y = 5$

D. $\frac{x^2}{9} + \frac{y^2}{4} = 1$

Answer: A

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18. If the eccentricity of a hyperbola is $\frac{5}{3}$, then the eccentricity of its conjugate hyperbola is

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

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

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

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

Answer: B

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19. If the vertices of a ΔABC are A = (2, 3, 5), $B = (-1, 3, 2), C = (3, 5, -2)$ then the area of the ΔABC (in sq. units) is

A. $6\sqrt{2}$

B. $8\sqrt{3}$

C. $9\sqrt{2}$

D. $8\sqrt{2}$

Answer: C

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20. If a line makes angles $\tan^{-1}\sqrt{7}, \frac{\tan^{-1}(\sqrt{5})}{\sqrt{3}}$ with x-axis, Y-axis respectively, then the angle made by it with Z-axis is

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

B. $\frac{\pi}{6}$ or $\frac{5\pi}{6}$

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

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

Answer: D

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21. A plane passes through the point (3, 5, 7). If the direction ratios of its normal are equal to the intercepts made by the plane $x + 3y + 2z = 9$ with the coordinate axes, then the equation of that plane is

A. $x + y + z = 5$

B. $6x + 2y + 3z = 105$

C. $12x + 4y + 6z = 49$

D. $6x + 2y + 3z = 49$

Answer: D

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22. If $f: [0, 2) \rightarrow$ R is defined by $f(x) = \begin{cases} 1 + \frac{2k}{k} & \text{for} \quad 0 \leq x < 1 \\ kx \quad \text{for} & 1 \leq x < 2 \end{cases}$ where $k > 0$, and f is such that $\lim_{x \to 1} f(x) = \lim_{x \to 1} f(x)$, then the value of k^2 is

A. 2

B. 1

C. 4

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

Answer: C

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23. If the function $f: R \to R$ defined by $f(x) = \begin{cases} \frac{\sin(a+1)x + \sin x}{x} & x < 0 \\ \frac{\sqrt{x+x^2} - \sqrt{x}}{x^{1/2}} & x > 0 \end{cases}$ continuous on R, then $a + b$=

A. -1

B. 2

C. 1

D. 3

Answer: A

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24. Let f be defined on D = $R - \{-1, 1\}$ by $f(x) = \dfrac{|x|}{1-|x|}$, then

A. f is differentiable on D

B. f is differentiable on D except at x = 0

C. f is continuous but not differentiable on D

D. f is differentiable but not continous on D

Answer: B

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25. If $x = \sec\theta - \cos\theta, y = \sec'\theta - \cos''\theta$, then $\dfrac{dy}{dx} =$

A. $\sqrt{\dfrac{y^2+4}{x^2+4}}$

B. $n\sqrt{\dfrac{y^2+4}{x^2+4}}$

C. $\sqrt{\dfrac{x^2+4}{y^2+4}}$

D. $n\sqrt{\dfrac{x^2+4}{y^2+4}}$

Answer: B

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26. If $y = a\sin x + (5+2x)\cos x, \quad \text{then} \quad y'' + y =$

A. 4 cos x

B. $-4\cos x$

C. $4\sin x$

D. $-4\sin x$

Answer: D

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27. The area (in sq. units) of the triangle formed by the tangent and the normal at the point $\left(\frac{a}{\sqrt{2}}, \frac{b}{\sqrt{2}}\right)$ to the curve $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ and the X-axis is

A. $\frac{a}{b}\left(a^2+b^2\right)$

B. 4ab

C. $\frac{b}{4a}\left(a^2+b^2\right)$

D. 2ab

Answer: C

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28. The interval in which the function $f(x)=2x^2-$ log x, for $x>0$ decreases, is

A. (2,4)

B. $\left(0, \frac{1}{4}\right)$

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

D. $\left(0, \frac{1}{2}\right)$

Answer: D

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29. If $f(x) = (x-1)(x-2)(x-3) f \text{ or } ' x \in [0, 4]$ then the value of $c \in (0, 4)$ satisfying Lagrange's mean value theorem, is

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

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

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

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

Answer: B

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30. The curve $f(x) = e^x \sin x$ is defined in the interval $[0, 2\pi]$. The value of x for which the slope of the tangent drawn to the curve at x is maximum, is

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

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

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

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

Answer: B

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31. $\int \frac{(x-1)dx}{(x+1)\sqrt{x^3+x^2+x}} =$

A. $\tan^{-1}\left(\frac{\sqrt{x^2+x+1}}{x}\right) + c$

B. $2. \tan^{-1}\left(\frac{x^2+x+1}{x}\right) + c$

C. $\tan^{-1}\left(\frac{x^2+x+1}{x}\right) + c$

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

Answer: D

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32. $\int\frac{\cos^3 x+\cos^5 x}{\sin^2 x+\sin^4 x}dx=$

A. $\sin x-6\tan^{-1}(\sin x)+c$

B. $\sin x-2(\sin x)^{-1}+c$

C. $\sin x-2(\sin x)^{-1}-6\tan^{-1}(\sin x)+c$

D. $\sin x-2(\sin x)^{-1}+5\tan^{-1}(\sin x)+c$

Answer: C

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33. $\int\frac{dx}{\tan x+\cot x+\sec x+\cos ecx}=$

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

B. $\frac{1}{2}(\sin x - \cos x - \tan x + \cot x) + c$

C. $\frac{1}{2}(\sin x - \cos x - x) + c$

D. $\frac{1}{2}(\sin x + \cos x - \tan x - \cot x) + c$

Answer: C

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34. If $f(x) = \int \cos ec^2 x dx$, then $f\left(\frac{\pi}{4}\right) =$

A. $-\frac{1}{4}\left[3\sqrt{2} - 5\log\left(\sqrt{2}+1\right)\right] + c$

B. $-\frac{1}{8}\left[5\sqrt{2} - 3\log\left(\sqrt{2}+1\right)\right] + c$

C. $-\frac{1}{8}\left[7\sqrt{2} + 3\log\left(\sqrt{2}+1\right)\right] + c$

D. $\frac{1}{8}\left[5\sqrt{2} + \log\left(\sqrt{2}+1\right)\right] + c$

Answer: C

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35. If a and b are positive integers such that $b > a$ then

$$\lim_{n \to \infty} \left[\frac{1}{na} + \frac{1}{na+1} + \frac{1}{na+2} + \ldots. + \frac{1}{nb}\right] =$$

A. $\log\left(\frac{b}{a}\right)$

B. $\log\left(\frac{a}{b}\right)$

C. log (ab)

D. $\log(a+b)$

Answer: A

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36. $\int_0^{\pi} \frac{x \tan x}{\sec x + \tan x} dx =$

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

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

C. $\dfrac{\pi(\pi+2)}{2}$

D. $\dfrac{\pi(\pi-2)}{2}$

Answer: D

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37. The area in the first quadrant enclosed by the axis, the line $x = y\sqrt{3}$ and the circle $x^2 + y^2 = 4$ is

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

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

C. $\dfrac{\pi}{2\sqrt{3}}$

D. $\dfrac{2\pi}{3\sqrt{2}}$

Answer: A

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38. If l and m are the degree and the order respectively of the differential equation of the family of all circles in the XY plane with radius 5 units. Then 2l + 3m =

A. 5

B. 10

C. 15

D. 7

Answer: B

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39. An integrating factor of the differential equation $\cos^2 x \frac{dy}{dx} - (\tan 2x)y = \cos^4 x$ is

A. $y = \frac{1}{2}\left[\frac{\tan 2x + c}{1 - \tan^2 x}\right]$

B. $y = \frac{1}{2}\left[\frac{\cos 2x + c}{1 - \tan^2 x}\right]$

C. $y=\frac{1}{2}\left[\frac{\sin 2x+c}{1-\tan^2 x}\right]$

D. $y=\frac{1}{2}\left[\frac{\sin x+c}{1-\tan^2 x}\right]$

Answer: C

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