



MATHS

BOOKS - KCET PREVIOUS YEAR PAPERS

KARNATAKA CET 2005

Mathematics

1. When 2^{301} is divided by 5, the least positive remainder is...

A. 4

B. 8

C. 2

D. 6

Answer: C



Watch Video Solution

2. The contrapositive of "If two triangles are identical, then these are similar" is...

A. If two triangles are not similar then
these are not identical

B. If two triangles are not identical then
these are not similar

C. If two triangles are not identical then
these are similar

D. If two triangles are not similar then
these are identical

Answer: A



Watch Video Solution

3. The contrapositive of the inverse of $p \rightarrow \sim q$ is...

A. $\sim q \rightarrow p$

B. $p \rightarrow q$

C. $\sim q \rightarrow \sim p$

D. $\sim q \rightarrow p$

Answer: A



Watch Video Solution

4. The contrapositive of the inverse of $p \rightarrow q$ is....

A. $\sim p \rightarrow q$

B. $p \rightarrow \sim q$

C. $q \text{ rarr } p$

D. $q \rightarrow p$

Answer: D



Watch Video Solution

5. If w is a complex cube-root of unity then,

$$\begin{vmatrix} 1 & \omega & \omega^2 \\ \omega & \omega^2 & 1 \\ \omega^2 & 1 & \omega \end{vmatrix}$$

A. -1

B. 1

C. 0

D. ω

Answer: C



Watch Video Solution

6. The ends of the latus rectum of the conic $x^2 + 10x - 16y + 25 = 0$ are...

- A. $(3, -4), (13, 4)$
- B. $(-3, 4), (13, -4)$
- C. $(3, 4), (-13, 4)$
- D. $(5, -8), (-5, 8)$

Answer: C



Watch Video Solution

7. The equation to the hyperbola having its eccentricity 2 and the distance between its foci 8 is...

A. $\frac{x^2}{12} - \frac{y^2}{4} = 1$

B. $\frac{x^2}{4} - \frac{y^2}{12} = 1$

C. $\frac{x^2}{8} - \frac{y^2}{2} = 1$

D. $\frac{x^2}{16} - \frac{y^2}{9} = 1$

Answer: B



Watch Video Solution

8. The solution of

$$\sin^{-1} x - \sin^{-1} 2x = \pm \frac{\pi}{3} \text{ is.....}$$

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

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

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

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

Answer: D



Watch Video Solution

9. In a $\triangle ABC$ if the sides are $a = 3$, $b = 5$ and $c = 4$ then $\sin\left(\frac{B}{2}\right) + \cos\left(\frac{B}{2}\right)$ is equal to

A. $\sqrt{2}$

B. $\frac{\sqrt{3} + 1}{2}$

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

D. 1

Answer: A



Watch Video Solution

10.

The value of

$$\cos(270^\circ + \theta)\cos(90^\circ - \theta) - \sin(270^\circ - \theta)\cos \theta$$

is...

A. 0

B. -1

C. $1/2$

D. 1

Answer: D



Watch Video Solution

11. The two circles
 $x^2 + y^2 - 2x + 22y + 5 = 0$ and
 $x^2 + y^2 + 14x + 6y + k = 0$ intersect
orthogonally provided k is equal to...

A. 47

B. -47

C. 49

D. - 49

Answer: A



Watch Video Solution

12. The radius of the circle

$$x^2 + y^2 + 4x + 6y + 13 = 0 \text{ is...}$$

A. $\sqrt{26}$

B. $\sqrt{13}$

C. $\sqrt{23}$

D. 0

Answer: D



Watch Video Solution

13. The centre of the circle

$$x = 2 + 3 \cos \theta, y = 3 \sin \theta - 1 \text{ is ...}$$

A. (3, 3)

B. (2, -1)

C. (-2, 1)

D. (-1,2)

Answer: B



Watch Video Solution

14. The sum of the focal distances of any point

on the conic $\frac{x^2}{25} + \frac{y^2}{16} = 1$ is...

A. 10

B. 9

C. 41

D. 18

Answer: A



Watch Video Solution

15. The eccentricity of the hyperbola

$$\frac{x^2}{16} + \frac{y^2}{25} = 1 \text{ is...}$$

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

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

C. $\frac{\sqrt{41}}{4}$

D. $\frac{\sqrt{41}}{5}$

Answer: C



Watch Video Solution

16. The solutions of the equation

$$\begin{vmatrix} x & 2 & -1 \\ 2 & 5 & x \\ -1 & 2 & x \end{vmatrix} = 0 \text{ are}$$

A. 3, -1

B. -3, 1

C. 3,1

D. -3, -1

Answer: A



Watch Video Solution

17. If $A = \begin{bmatrix} 3 & 5 \\ 2 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 17 \\ 0 & -10 \end{bmatrix}$ then

$|AB|$ is equal to _____

A. 80

B. 100

C. -110

D. 92

Answer: B



Watch Video Solution

18. The inverse of the matrix $\begin{bmatrix} 5 & -2 \\ 3 & 1 \end{bmatrix}$ is....

A. $\frac{1}{11} \begin{bmatrix} 1 & 2 \\ -3 & 5 \end{bmatrix}$

B. $\begin{bmatrix} 1 & 2 \\ -3 & 5 \end{bmatrix}$

C. $\frac{1}{13} \begin{bmatrix} -2 & 5 \\ 1 & 3 \end{bmatrix}$

D. $\begin{bmatrix} 1 & 3 \\ -2 & 5 \end{bmatrix}$

Answer: A



Watch Video Solution

19. The projection of the vector $2\hat{i} + \hat{j} - 3\hat{k}$ on the vector $\hat{i} - 2\hat{j} + \hat{k}$ is...

A. $-\frac{3}{\sqrt{14}}$

B. $\frac{3}{\sqrt{14}}$

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

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

Answer: C



Watch Video Solution

20. A unit vector perpendicular to the plane containing the vectors $\hat{i} - \hat{j} + \hat{k}$ and $-\hat{i} + \hat{j} + \hat{k}$ is...

A. $\frac{\hat{i} - \hat{j}}{\sqrt{2}}$

B. $\frac{\hat{i} + \hat{k}}{\sqrt{2}}$

C. $\frac{\hat{i} - \hat{k}}{\sqrt{2}}$

D. $\frac{\hat{i} + \hat{j}}{\sqrt{2}}$

Answer: D



Watch Video Solution

21. If $12 \cot^2 \theta - 31 \operatorname{cosec} \theta + 32 = 0$ then the value of $\sin \theta$ is...

A. $\frac{3}{5}$ or 1

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

C. $\frac{4}{5}$ or $\frac{3}{4}$

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

Answer: C



Watch Video Solution

22. The circum-radius of the triangle whose sides are 13, 12 and 5 is...

A. 15

B. $13/2$

C. $15/2$

D. 6

Answer: B



Watch Video Solution

23. If $\tan^{-1} x + \tan^{-1} y = \frac{\pi}{4}$ then...

A. $x + y + xy = 1$

B. $x + y - xy = 1$

C. $x + y + xy + 1 = 0$

$$D. x + y - xy + 1 = 0$$

Answer: A



Watch Video Solution

24. The general solution of

$$\sin x - \cos x = \sqrt{2}, \text{ for any integer 'n' is}$$

A. $n\pi$

B. $2n\pi + \frac{3\pi}{4}$

C. $2n\pi$

D. $(2n + 1)\pi$

Answer: B



Watch Video Solution

25. The amplitude of $\frac{1 + \sqrt{3}i}{\sqrt{3} + i}$ is

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

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

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

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

Answer: D



Watch Video Solution

26. The sum to infinity of the progression

$$9 - 3 + 1 - \frac{1}{3} + \dots \text{ is}$$

A. 9

B. $9/2$

C. $27/4$

D. $15/2$

Answer: C



Watch Video Solution

27. If $C_{12} = {}^n C_6$ then $(n)_2^C =$

A. 72

B. 153

C. 306

D. 2556

Answer: B



Watch Video Solution

28. The middle term in the expansion of

$$\left(\frac{x - (1)}{x}\right)^{18} \text{ is...}$$

A. ${}^{18}C_9$

B. ${}^{-18}C_9$

C. ${}^{18}C_{10}$

D. ${}^{-18}C_{10}$

Answer: A



29. If α, β, γ are the roots of the equation $2x^3 - 3x^2 + 6x + 1 = 0$ then $\alpha^2 + \beta^2 + \gamma^2$ is equal to.....

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

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

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

D. 4

Answer: A



Watch Video Solution

30. The digit in the units place in the number

7^{289} is...

A. 9

B. 7

C. 1

D. 3

Answer: B



Watch Video Solution

31. If a , b and c are mutually perpendicular unit vectors, then $|a + b + c|$ is equal to...

A. 3

B. $\sqrt{3}$

C. $\sqrt{a^2 + b^2 + c^2 / 3}$

D. 1

Answer: B



Watch Video Solution

32. The identity element in the group

$$M = \left\{ \begin{pmatrix} x & x \\ x & x \end{pmatrix} \mid x \in \mathbb{R}, x \neq 0 \right\} \quad \text{with}$$

respect to matrix multiplication is..

A. $\begin{pmatrix} 1 & 1 \\ 1 & 1 \end{pmatrix}$

B. $\frac{1}{2} \begin{pmatrix} 1 & 1 \\ 1 & 1 \end{pmatrix}$

C. $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$

D. $\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$

Answer: B



Watch Video Solution

33. In the group $G = \{1,3,7,9\}$ under multiplication modulo 10, the inverse of 3 is...

A. 1

B. 3

C. 7

D. 9

Answer: C



View Text Solution

34. In the group $(Q^+ \cdot)$ of positive rational numbers w.r.t. the binary operation $*$ defined $a * b = \frac{ab}{3} \forall a, b \in Q^+$ the solution of the equation $5 * x = 4^{-1} \in Q^+$ is...

A. $\frac{27}{20}$

B. $\frac{20}{27}$

C. $\frac{1}{20}$

D. 20

Answer: A



Watch Video Solution

35. $(0, -1)$ and $(0, 3)$ are two opposite vertices of a square. The other two vertices are...

A. $(0, 1), (0, -3)$

B. $(3, -1), (0, 0)$

C. $(2, 1), (-2, 1)$

D. $(2, 2), (1, 1)$

Answer: C



[View Text Solution](#)

36. The equation to the line bisecting the join of (3,-4) and (5,2) and having its intercepts on the x-axis and the y-axis in the ratio 2:1 is...

A. $x + y - 3 = 0$

B. $2x - y = 9$

C. $x + 2y = 2$

D. $2x + y = 7$

Answer: C



Watch Video Solution

37. The distance between the pair of parallel lines $x^2 + 2xy + y^2 - 8ax - 8ay - 9a^2 = 0$ is...

A. $2\sqrt{5}a$

B. $\sqrt{10}a$

C. $10a$

D. $5\sqrt{2}a$

Answer: D



Watch Video Solution

38. The equation to the circle with centre $(2, 1)$ and touching the line $3x + 4y = 5$ is...

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

B. $x^2 + y^2 - 4x - 2y - 5 = 0$

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

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

Answer: C



39. The condition for a line $y = 2x + c$ to touch the circle $x^2 + y^2 = 16$ is...

A. $c = 10$

B. $c^2 = 80$

C. $c = 12$

D. $c^2 = 64$

Answer: B



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

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

B. $2 \log(1 + \cos^2 x) + C$

C. $\frac{1}{2} \log(1 + \cos 2x) + C$

D. $C - \log(1 + \cos^2 x)$

Answer: D



Watch Video Solution

41. $\int e^x \left(\frac{1 + \sin x}{1 + \cos x} \right) dx =$

A. $e^x \tan\left(\frac{x}{2}\right) + C$

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

C. $e^x \left(\frac{1 + \sin x}{1 - \cos x} \right) + C$

D. $C - e^x \cot\left(\frac{x}{2}\right)$

Answer: A



Watch Video Solution

42. $\int \frac{1 + \tan x}{e^{-x} \cdot \cos x} dx =$

A. $e^{-x} \tan x + C$

B. $e^{-x} \sec x + C$

C. $e^x \sec x + C$

D. $e^x \tan x + C$

Answer: C



Watch Video Solution

43. $\int_{\pi/4}^{\pi/2} \cos ec^2 x dx = \dots$

A. -1

B. 1

C. 0

D. $1/2$

Answer: B



Watch Video Solution

$$44. \int_0^{\pi/4} \log(1 + \tan x) dx = \dots .$$

A. $\frac{\pi}{8} \log_e 2$

B. $\frac{\pi}{4} \log_2 2$

C. $\frac{\pi}{4} \log_e 2$

D. $\frac{\pi}{8} \log_e \left(\frac{1}{2} \right)$

Answer: A



Watch Video Solution

45. The modulus and amplitude of

$$\frac{1 + 2i}{1 - (1 - i)^2} \text{ are}$$

A. $\sqrt{2}$ and $\frac{\pi}{6}$

B. 1 and 0

C. 1 and $\frac{\pi}{4}$

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

Answer: B



Watch Video Solution

46. The real part of $\frac{1}{1 + \cos \theta + i \sin \theta}$ is

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

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

C. $\sqrt{2}$

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

Answer: B



Watch Video Solution

47. $\lim_{x \rightarrow 0} \frac{\tan x - \sin x}{x^3}$ is equal to...

A. $1/2$

B. $-1/2$

C. 0

D. 1

Answer: A



Watch Video Solution

48. If $y = \frac{e^x + e^{-x}}{e^x - e^{-x}}$ then is equal to...

A. $\sec h^2 x$

B. $\cos ech^2 x$

C. $-\sec h^2 x$

D. $-\cos e^{ch^2x}$

Answer: D



Watch Video Solution

49. If $f(x) = \begin{cases} \frac{\sin 5x}{x^2 + 2x}, & x \neq 0 \\ k + \frac{1}{2}, & x = 0 \end{cases}$ is continuous at $x = 0$

then the value of k is...

A. 1

B. -2

C. 2

D. 1/2

Answer: C



Watch Video Solution

50. The are bounded by the parabola

$y^2 = 4ax$ and the line $x = a$ and $x = 4a$ is...

A. $\frac{35a^2}{3}$

B. $\frac{4a^2}{3}$

C. $\frac{7a^2}{3}$

D. $\frac{28a^2}{3}$

Answer: D



Watch Video Solution

51. A population $p(t)$ of 1000 bacteria introduced into nutrient medium grows according to the relation

$$p(t) = 1000 + \frac{1000t}{100 + t^2}$$

The maximum size of

this bacterial population is...

A. 1100

B. 1250

C. 1050

D. 5250

Answer: C



Watch Video Solution

52. Form the differential equation of the family of circles touching the y -axis at origin.

$$\text{A. } x^2 + y^2 - 2xy \frac{dy}{dx} = 0$$

$$\text{B. } x^2 + y^2 + 2xy \frac{dy}{dx} = 0$$

$$\text{C. } x^2 - y^2 - 2xy \frac{dy}{dx} = 0$$

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

Answer: D



Watch Video Solution

53. The area of the region bounded by the curve $9x^2 + 4y^2 - 36 = 0$ is

A. 9π

B. 4π

C. 36π

D. 6π

Answer: D



Watch Video Solution

54. The general solution of the differential equation

$$(2x - y + 1)dx + (2y - x + 1)dy = 0 \text{ is...}$$

A. $x^2 + y^2 + xy - x + y = C$

B. $x^2 + y^2 - xy + x + y = C$

C. $x^2 - y^2 + 2xy - x + y = C$

D. $x^2 - y^2 - 2xy + x - y = C$

Answer: B



Watch Video Solution

55. If $y = \tan^{-1} \left(\frac{\sqrt{1+x^2} - \sqrt{1-x^2}}{\sqrt{1+x^2} + \sqrt{1-x^2}} \right)$ then

$dy/dx =$

A. $\frac{x^2}{\sqrt{1-x^4}}$

B. $\frac{x^2}{\sqrt{1-x^4}}$

C. $\frac{x}{\sqrt{1-x^4}}$

D. $\frac{x}{\sqrt{1-x^4}}$

Answer: D



Watch Video Solution

56. If $x = \sin t$, $y = \cos pt$ then...

A. $(1-x^2)y_2 + xy_1 + p^2y = 0$

$$\text{B. } (1 - x^2)y_2 + xy_1 + p^2y = 0$$

$$\text{C. } (1 + x^2)y_2 - xy_1 + p^2y = 0$$

$$\text{D. } (1 - x^2)y_2 - xy_1 + p^2y = 0$$

Answer: D



Watch Video Solution

57. If ST and SN are the lengths of the subtangent and the subnormal at the point

$\theta = \frac{\pi}{2}$ on the curve

$$x = a(\theta + \sin \theta), y = a(1 - \cos \theta), a \neq 1$$

then...

A. $ST = SN$

B. $ST = 2SN$

C. $ST^2 = aSN^3$

D. $ST^3 = aSN$

Answer: A



Watch Video Solution

58. If θ is the acute angle of intersection at a real point of intersection of the circle $x^2 + y^2 = 5$ and the parabola $y^2 = 4x$ then $\tan \theta$ is equal to...

A. 1

B. $\sqrt{3}$

C. 3

D. $(1)\sqrt{3}$

Answer: C



Watch Video Solution

59. A spherical balloon is being inflated at the rate of 35 cc//min . The rate of increase of the surface area of the balloon when its diameter is 14 cm is...

- A. 7 Sq.cm//min
- B. 10 Sq.cm//min
- C. 17.5 Sy.cm//min
- D. 28 Sq. cm//min.

Answer: B



Watch Video Solution