MATHS

BOOKS - BHARATI BHAWAN MATHS (HINGLISH)

Screening Tests

Exercise

1. For all $'x', x^2 + 2ax + (10 - 3a) > 0,$ then the interval in which $'a'$ lies is (2004, 1M) $a < -5$ (b) `-55(d)2

A. $a < -5$

B. $-5 < a < 2$

C. $a > 5$

D. $2 < a < 5$

Answer:

Watch Video Solution

2. If $A = \begin{bmatrix} \alpha & 2 \\ 2 & \alpha \end{bmatrix}$ and $\left|A^3\right| = 125$, then the value of α is :

A. ± 1

B. ± 2

C. ± 3

D. ± 5

Answer:

Watch Video Solution

3. If a,b,c and d are four positive real numbers such that abcd=1 , what is the minimum value of $(1+a)(1+b)(1+c)(1+d)$.

A. 4

B. 16

C. 8

D. 32

Answer:

Watch Video Solution

4. How many ways are there to arrange the letters in the word GARDEN with the vowels in alphabetical order ?

A. 120

B. 240

C. 360

D. 480

Answer:

Watch Video Solution

5. If $f: R \to S$, defined by $f(x) = \sin x - \sqrt{3}\cos x + 1$, is onto then the interval of S, is

A. $[-1, 1]$

B. $[-1, 3]$

C. $[-1, 2]$

D. $[0, 1]$

Answer:

Watch Video Solution

6. If $f(x) = \sin x + \cos x$ and $g(x) = x^2 - 1$, then $g(f(x))$ is invertible in the domain .

A. $\left[0, \frac{\pi}{2}\right]$

B. $\left[-\frac{\pi}{4}, \frac{\pi}{4}\right]$

C. $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$

D. $[0, \pi]$

Answer:

Watch Video Solution

7. If $\lim_{x \to \infty} \left(1 + \frac{a}{x} + \frac{b}{x^2}\right)^{2x} = e^2$ then the values of a and b, are

A. $a \in R, b \in R$

B. $a = a, b \in R$

C. $a \in R, b = 2$

D. $a = 1, b = 2$

Answer:

Watch Video Solution

8. If $\int \frac{\sin x}{\sin(x-\alpha)} dx = Ax + B \log \sin(x-\alpha) + C$, then the value of (A,B) , is

A. $(\sin \alpha, \cos \alpha)$

B. $(\cos \alpha, \sin \alpha)$

C. $(-\sin \alpha, \cos \alpha)$

D. $(-\cos \alpha, \sin \alpha)$

Answer:

Watch Video Solution

9. The solution of the differential equation $ydx + \left(x + x^2y\right)dy = 0$ is

A. $-\left(\frac{1}{x}y\right) = c$

B. $-\frac{1}{x}y + \log y = c$

C. $\frac{1}{x}y + \log y = c$

D. $\log y = cx$

Answer:

Watch Video Solution

10. If θ and ϕ are positive acute angles satisfying $\sin\theta = \frac{1}{2}$ and $\cos\phi = \frac{1}{3}$, then the value of $(\theta + \phi)$ lies in the interval-

A. $\left(\frac{\pi}{3}, \frac{\pi}{2}\right]$

B. $\left(\frac{\pi}{2}, 2\frac{\pi}{3}\right]$

C. $\left(2\frac{\pi}{3}, 5\frac{\pi}{6}\right]$

D. $\left(5\frac{\pi}{6}, \pi\right]$

Answer:

Watch Video Solution

11. The value of x for which $\sin\left(\cot^{-1}(1+x)\right) = \cos\left(\tan^{-1}x\right)$ is

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

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

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

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

Answer:

Watch Video Solution

12. The sides of a triangle are $\sin\alpha, \cos\alpha$ and $\sqrt{1+\sin\alpha\cos\alpha}$ where $0<\alpha<\frac{\pi}{2}$. Then the greatest angle of the triangle is-

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

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

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

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

Answer:

Watch Video Solution

13. If the line $2x+\sqrt{6}y=2$ touches the hyperbola $x^2-2y^2=4$, then the point of contact is

A. $\left(-2, \sqrt{6}\right)$

B. $\left(-5, 2\sqrt{6}\right)$

C. $\left(\frac{1}{2}, \frac{1}{\sqrt{6}}\right)$

D. $(4, -\sqrt{6})$

Answer:

Watch Video Solution

14. If 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, then k is equal to (1) -1 (2) $\frac{2}{9}$ (3) $\frac{9}{2}$ (4) 0

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

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

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

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

Answer:

Watch Video Solution

15. Let $\vec{a}, \vec{b}, \vec{c}$ be three non-zero vectors such that any two of them are non-collinear. If $\vec{a} + 2\vec{b}$ is collinear with $\vec{c}$ and $\vec{b} + 3\vec{c}$ is collinear with $\vec{a}$ then prove that $\vec{a} + 2\vec{b} + 6\vec{c} = \vec{0}$

A. $\lambda\vec{a}$

B. $\lambda\vec{b}$

C. $\lambda\vec{c}$

D. $\vec{0}$

Answer:

Watch Video Solution

16. The probability that A speaks truth is $\frac{4}{5}$, while this probability for B is $\frac{3}{4}$. The probability that they contradict each other when asked to speak on a fact is

A. $\frac{3}{20}$

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

C. $\frac{7}{20}$

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

Answer:

Watch Video Solution

17. If three distinct numbers are chosen randomly from the first 100 natural numbers, then the probability that all three of then are divisible by 2 or 3, is

A. $\frac{4}{25}$

B. $\frac{4}{35}$

C. $\frac{4}{33}$

D. $\frac{4}{1155}$

Answer:

Watch Video Solution

18. If $4x^4 + 9y^4 = 64$ then the maximum value of $x^2 + y^2$ is (where x and y are real)

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

B. $\frac{4}{3}\sqrt{13}$

C. $\frac{32}{3}$

D. $\frac{32}{13}$

Answer:

Watch Video Solution

19. If $\log_{30}(3) = \alpha$ and $\log_{30}(5) = \beta, then \log_{30}(8)$ is equal to

A. 1+a+b

B. 3(1-a-b)

C. 3(1+a+b)

D. $a + b$

Answer:

Watch Video Solution

20. An infinite G.P has first term x and sum 5 then x belongs to ?

A. $(- \infty, \ - 10)$

B. $(- 10, 0)$

C. $(0, 10)$

D. $(10, \ + \infty)$

Answer:

Watch Video Solution

21. The number of ways of distributing 8 identical balls in 3 distinct boxes so that none of the boxes is empty is

A. 5

B. 21

C. 3^8

D. ^8C_3`

Answer:

Watch Video Solution

22. The coefficient of the middle term in the binomial expansion in powers of x of $(1+\alpha x)^4$ and $(1-\alpha x)^6$ is the same if $\alpha =$

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

B. $\frac{10}{3}$

C. $-\frac{3}{10}$

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

Answer:

Watch Video Solution

23. If $(n-1)C_r = \left(k^2-3\right)nC_{r+1}$,then k belong to

A. $(-\infty, -2)$

B. $2, +\infty)$

C. $\left[-\sqrt{3}, \sqrt{3}\right]$

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

Answer:

Watch Video Solution

24. If the graph of the function y = f(x) is symmetrical about the line x = 2, then

A. $f(x+2) = f(x-2)$

B. $f(2+x) = f(2-x)$

C. $f(x) = f(-x)$

D. $f(x) = -f(-x)$

Answer:

Watch Video Solution

25. If the sides of a triangle are in the ratio $1 : \sqrt{3} : 2$, then the angles of the triangle are in the ratio

A. $1:3:5$

B. $2:3:4$

C. $3:2:1$

D. $1:2:3$

Answer:

Watch Video Solution

26. Let $f(x)$ be a strictly increasing and differentiable function, then $\lim_{x \to 0} \frac{f(x^2) - f(x)}{f(x) - f(0)}$

A. 1

B. 0

C. -1

D. 2

Answer:

Watch Video Solution

27. If $f(x) = x^a \log x$ and $f(0) = 0$ then the value of α for which Rolle's theorem can be applied in [0,1] is

A. -2

B. -1

C. 0

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

Answer:

Watch Video Solution

28. Let $f(x) = \frac{1 - \tan x}{4x - \pi}, x \neq \frac{\pi}{4}, x \in \left[0, \frac{\pi}{2}\right]$. If f(x) is continuous in $\left[0, \frac{\pi}{2}\right]$, then $f\left(\frac{\pi}{4}\right)$ is

A. 1

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

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

D. -1

Answer:

Watch Video Solution

29. Let $f(x+y)+f(x-y)=2f(x)f(y)\,\forall x, y \in R$ and $f(0)=k$, then

A. $f(2)+f(-2)=0$

B. $f(3)+f(-3)=0$

C. $f'(2)+f'(-2)=0$

D. $f'(3)+f^1(-3)$

Answer:

Watch Video Solution

30. The area enclosed between the curves $y = ax^2$ and $x = ay^2 (a > 0)$ is 1 sq. unit, value of a is $\frac{1}{\sqrt{3}}$ (b) $\frac{1}{2}$ (c) 1 (d) $\frac{1}{3}$

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

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

C. 1

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

Answer:

Watch Video Solution

31. $\lim_{n \to \infty} \sum_{r=1}^{n} \frac{1}{n} e^{\frac{r}{n}}$ is (A) $1 - e$ (B) $e - 1$ (C) e (D) $e + 1$

A. e

B. $e - 1$

C. $1 - e$

D. $1 + e$

Answer:

Watch Video Solution

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

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

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

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

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

Answer:

Watch Video Solution

33. A variable circle passes through the fixed point $A(p, q)$ and touches the x-axis. The locus of the other end of the diameter through A is-

A. $(x-p)^2 = 4qy$

B. $(x-q)^2 = 4py$

C. $(y-p)^2 = 4qx$

D. $(y-q)^2 = 4px$

Answer:

Watch Video Solution

34. If the straighat lines $x = 1+s, y = -3-\lambda s, z = 1+\lambda s$ and $x = \frac{t}{2}, y = 1+t, z = 2-t$ with parameters s and t respectively, are coplanar, then λ equals (A) $-\frac{1}{2}$ (B) -1 (C) -2 (D) 0

A. -2

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

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

D. 0

Answer:

Watch Video Solution

35. A line line makes the same angle θ with each of the x and z-axes. If the angle β, which it makes with y-axis, is such that $\sin^2\beta = 3\sin^2\theta$ then $\cos^2\theta$ equals

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

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

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

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

Answer:

Watch Video Solution

36. Let $\vec{u}, \vec{v} and \vec{w}$ be such that $\left|\vec{u}\right| = 1, \left|\vec{v}\right| = 2 and \left|\vec{w}\right| = 3.$ If the projection of $\vec{v}$ along $\vec{u}$ is equal to that of $\vec{w}$ along $\vec{u}$ and vectors $\vec{v} and \vec{w}$ are perpendicular to each other, then $\left|\vec{u} - \vec{v} + \vec{w}\right|$ equals 2 b. $\sqrt{7}$ c. $\sqrt{14}$ d. 14

A. 2

B. $\sqrt{7}$

C. $\sqrt{14}$

D. 14

Answer:

Watch Video Solution

37. If $\vec{a}, \vec{b}, and \vec{c}$ be non-zero vectors such that no tow are collinear or $\left(\vec{a} \times \vec{b}\right) \times \vec{c} = \frac{1}{3}\left|\vec{b}\right|\left|\vec{c}\right|\vec{a}$. If θ is the acute angle between vectors $\vec{b} and \vec{c}$, then find the value of $s \int h\eta$.

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

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

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

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

Answer:

Watch Video Solution

38. Let $v = 2\vec{i} + \vec{j} - \vec{k}, w = \vec{i} + 3\vec{k}$ and $\vec{u}$ is a unit vector then the maximum value of scalar triple product.

A. `-1'

B. $\sqrt{10}+\sqrt{6}$

C. $\sqrt{59}$

D. $\sqrt{60}$

Answer:

Watch Video Solution