doubtnut
India's Number 1 Education App

MATHS

BOOKS - S CHAND MATHS (ENGLISH)

SELF ASSESSMENT PAPER 4

Section A

1. The number of proper subsets of A = {1,2,3,4,5) is .....

A. 16

B. 32

C. 15

D. 31

Answer:

Watch Video Solution

2. The maximum value of sin x cos x is .....

A. 1

B. 0

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

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

Answer:

Watch Video Solution

3. The value of $\frac{1-\tan 15^\circ}{1+\tan 15^\circ}$

A. 1

B. $\sqrt{3}$

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

D. ∞

Answer:

Watch Video Solution

4. The thrid term of a G.P is 3, then the product of its first five terms is .....

A. 9

B. 27

C. 81

D. 243

Answer:

 Watch Video Solution

5. If α and β are the root of the equation $x^2 - 4x + 5 = 0$, then $\alpha^2 + \beta^2$ = _____

A. 64

B. 4

C. 16

D. 256

Answer:

Watch Video Solution

6. Thrid term in the expansion of $(2x - 3)^5$ is _____

A. $= 240x$

B. $720x^3$

C. $720x^2$

D. 240 x

Answer:

Watch Video Solution

7. The real part of $(2 + 3i)^2$ is _____

A. 4

B. 2

C. -5

D. 12

Answer:

Watch Video Solution

8. The distance of the centre of the circle $x^2 + y^2 + 6x + 8y - 11 = 0$ from origin is _____

A. 3

B. 4

C. 5

D. 6

Answer:

Watch Video Solution

9. If the lines $2x + y - 5 = 0$ and $kx - 2y + 7 = 0$ are perpendicular, then k = _____

A. 1

B. -1

C. 2

D. -2

Answer:

Watch Video Solution

10. $\lim_{x \to 0} \frac{1 - \cos 2x}{x^2}$ = _____

A. 0

B. 1

C. 2

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

Answer:

Watch Video Solution

11. Write the range of the signum function.

Watch Video Solution

12. How many words can be formed using all the letters of the word HEXAGON if repetition is not allowed?

Watch Video Solution

13. Find the co-efficient of x^2 in the expansion of $(x+2)^6$.

Watch Video Solution

14. Find the derivative of x^2 sinx w.r.t.x.

Watch Video Solution

15. A and B are two sets such that n(A) = 20, n(B) = 30 and n $(A \cup B)$ = 48, find n(A - B)

Watch Video Solution

16. When a coin is tossed write two events which are mutually exclusive and exhausitve.

Watch Video Solution

17. Write the sets in the roster form

A = $\{x : x \in W \text{ and } 5 < x \leq 9\}$

Watch Video Solution

18. Write the sets in the roster form

$B = \{x : x \in N \text{ and } 4 < x^2 < 60\}$

Watch Video Solution

19. Prove that : $\cos 10^\circ + \cos 110^\circ + \cos 130^\circ = 0.$

Watch Video Solution

20. Show that: $\sin(40^\circ + \theta)\cos(10^\circ + \theta) - \cos(40^\circ + \theta)\sin(10^\circ + \theta) = \frac{1}{2}$

Watch Video Solution

21. Find the value of $\sin 75^\circ$.

Watch Video Solution

22. Find the value of $i^4 + i^5 + i^6 + i^7$.

Watch Video Solution

23. If α and β are the roots of $2x^2 + 5x - 4 = 0$ then find the value of $\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$.

Watch Video Solution

24. If f(x) = y = $\frac{ax - b}{cx - a}$, then prove that f(y) = x.

Watch Video Solution

25. Prove that : $\tan 70^\circ = \tan 20^\circ + 2\tan 50^\circ$

Watch Video Solution

26. Prove that : $\frac{\cos 4x \sin 3x - \cos 2x \sin x}{\sin 4x . \sin x + \cos 6x . \cos x}$ = tan 2x

Watch Video Solution

27. Prove by the principal of mathematica induction that $3^n > 2^n$, for all $n \in N$.

Watch Video Solution

28. Prove by the principle of mathematical induction that for all $n \in N$:

$$1^2 + 2^2 + 3^2 + \ + n^2 = \frac{1}{6}n(n+1)(2n+1)$$

Watch Video Solution

29. The roots of the equation $px^2 - 2(p+2)x + 3p = 0$ differ by 2 Find p and also

the roots.

Watch Video Solution

30. Find the value of 'a' and 'b' $\lim_{x \to 2}$ and $\lim_{x \to 4}$ exists where

$$f(x)\begin{cases} x^2 + ax + b & 0 \leq x < 2 \\ 3x + 2 & 2 \leq x \leq 4 \\ 2ax + 5b & 4 < x \leq 8 \end{cases}$$

Watch Video Solution

31. If $y = \dfrac{x}{x+5}$, then prove that $x\dfrac{dy}{dx} = y(1-y)$

Watch Video Solution

32. Let the sum of n, 2n, 3n terms of an A.P. be S_1, S_2 and S_3 respectively. Show that $S_3 = 3(S_2 - S_1)$.

Watch Video Solution

33. The sum of two numbers is 6 times their geometric mean, show that the numbers are in the ratio $(3 + 2\sqrt{2}) : (3 - 2\sqrt{2})$

Watch Video Solution

34. If p and q are the lengths of perpendiculars from the origin to the lines $x\cos\theta - y\sin\theta = k\cos 2\theta$ and $x\sec\theta + y\ \operatorname{cosec}\theta = k$, respectively, prove that $p^2 + 4q^2 = k^2$.

Watch Video Solution

35. Find the mean deviation about the mean for the following data :

Income per day	0-100	100-200	200-300	300-400	400-500	500-600	600-700	700-800
Number of Persons	4	8	9	10	7	5	4	3

Watch Video Solution

Section B

1. The eccentricity of te ellipse $\frac{x^2}{16} + \frac{y^2}{4} = 1$ is _____

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

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

C. 1

D. 0

Answer:

Watch Video Solution

2. XY plane divides the line segment joining the points (1,2,-3) and (0,1,5) in the ratio _____

A. 2 : 1 internally

B. 2 : 1 externally

C. 3 : 5 internally

D. 3 : 5 internally

Answer:

Watch Video Solution

3. Find the length of transverse axis of the hyperbola $4x^2 - 3y^2 = 24.$

Watch Video Solution

4. The major axis of an ellipse is twice its minor axis. Find its eccentricity.

Watch Video Solution

5. Write the converse : If 2 and 3 are even, then 2 + 3 = 6'.

Watch Video Solution

6. Write converse and inverse of the given statement if y^2 is divisible by 4, then y is an even number.

Watch Video Solution

7. Show that the statement "For any real numbers a and b, $a^2 = b^2$ implies that $a = b$ " is not true by giving a counter example.

Watch Video Solution

8. Find the foci, vertices and eccentricity of the ellispe $36x^2 + 4y^2 = 144.$

Watch Video Solution

9. If the origin is the centroid of the ΔPQR with vertices $P(2a, 2, 6), Q(-4, 3b, 10)$ and $R(8, 14, 2c)$

then find the values of $a + b + c$.

Watch Video Solution

10. What are the coordinate of the vertices of a cube whose edge is 2 units, one of whose vertices coincides with the origin and three edge passing through the origin coincides with the positive direction of the axis θ through the origin.

Watch Video Solution

Section C

1. The median of the 10 different observations is 46. If the observation 70 is replaced with 100 then the new median is _____

A. 70

B. 100

C. 46

D. can't be determined

Answer:

Watch Video Solution

2. The mean of 10 different observation is 46. If the observation 71 is replaced with 17 the new mean is _____

Watch Video Solution

3. Find the median of the following set of numbers : 10, 75, 3, 81, 18, 27, 4, 48, 12, 47, 9, 15

Watch Video Solution

4. The number of students in section X A and X B are 30 and 35 respectively. The mean scores of students in the

mathematices test are as follows:

$X A$	$X B$	$X A$ and $X B$ combined
70	?	62

Watch Video Solution

5. Construct Consumer Price Index number with the help of the following data :

Consumer Items	Price	Weight
Food	125	40
Fuel	120	10
Cloth	66.67	25
House Rent	120	15
Miscellaneous	150	10

Watch Video Solution

6. A school has four sections in Class XII having 50, 39, 42, 48 students of the four section. In a mathematics test the average marks were 60, 55, 57 and 48 respectively. What was the overall average of the marks per student?

Watch Video Solution

7. Given r = 0.8, $\sum xy = 60, \sigma_y = 2.5$ and $\sum x^2 = 90$, find the number of items, where x and y are deviation from their respective means.

Watch Video Solution

8. The mean age of a combined group of men and women is 25 years. If the mean age of the group of men is 26 years and that of group that of women is 21 years, then find the percentage of men and women in the group.

Watch Video Solution

9. If $\sum x_1 = 16, \sum y_1 = 48$ $\sum (x_1 - 3)(y_1 - 4) = 22$ and $n = 2$, find the cov (x,y).

Watch Video Solution

10. Calculate five yearly moving average of the number of students of who have studied in a school given below.

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
No. of Students	442	427	467	502	512	515	520	527	515	541

Watch Video Solution