

MATHS BOOKS - JBD PUBLICATION

MODEL PAPER (4)

Exercise

1. If sets A={1,2,3,4} and B={2,4,6,8}, then A-B is:

A. {-1,-2,-3,-4}

B. {1,3}

C. {1,0,3}

D. none of these

Answer:



Watch Video Solution

2. The number of relations that can be defined on the set {x,y,z} is:

A. 9

B. 2^{9}

 $c. 2^9 - 1$

D. $2^8 - 1$

Answer:



Watch Video Solution

3. The angle between the minute and hour hands of a clock at 5:40 is:

A. 70°

B. 85°

C. 55°

D. none of these

Answer:



4. The value of $i^9 + i^{19}$ is:

A. i

B.-i

C. 0

D. none of these

Answer:



Watch Video Solution

5. The value of $\frac{{}^nC_r}{\hat{}^nC_{r+1}}$ is equal to:

A.
$$\frac{r+1}{n-r}$$

B.
$$\frac{n}{n-r}$$

C.
$$\frac{n-r}{r}$$

D. none of these

Answer:



Watch Video Solution

6. If x, 2y, 3z are in A.P where distinct numbers x,y,z are in GP then the common ratio of the G.P. is

 $\frac{1}{3}$

C. 1

D. none of these

Answer:



Watch Video Solution

7. The lines x+(k-1)y+1=0 and $2x+k^2y-1=0$ are at right angles if

A. k=1

B. kgt1

C. k=-1

D. none of these

Answer:



Watch Video Solution

8. The latus rectum of the ellipse $16x^2+y^2=16$ is:

A.
$$/12$$

$$\mathsf{B.}\,\frac{\sqrt{5}}{2}$$

$$\mathsf{C.}\,\frac{\sqrt{3}}{5}$$

D. none of these

Answer:



9. $\lim_{x \to \frac{\pi}{2}} \frac{1 - \sin x}{\cos x}$ is equal to:

A. 0

B. -1

C. 1

D. none of these

Answer:



Watch Video Solution

10. A die is rolled then the probability that a number 1 or 6 may appear is:

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

$$\mathsf{B.}\;\frac{2}{5}$$

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

D. none of these

Answer:



Watch Video Solution

 $\frac{\sin 5x + \sin 3x}{\cos 5x + \cos 3x} = \tan 4x$ **11.** Prove the following:



12. Find the principal solutions of $\cos x = -\frac{1}{\sqrt{2}}$.



Watch Video Solution

13. Express $\left(-2-rac{1}{3}i
ight)^3$ in the form of a+ib.



Watch Video Solution

14. Prove that: $\sum_{r=0}^n 3^{rn} C_r = 4^n$.



15. Using Binomial Theorem, evaluate each of the following: $(99)^5$.



16. Find the points on x-axis which are at a distance of $\sqrt{29}$ units from point A(1,2,3).



17. Write the negation of the following statements

p: all cats scratch.



18. Find the component statements of the following compound statements and check whether they are true or false.

100 is divisible by 3, 11 or 5.



Watch Video Solution

19. Find the range of $f(x) = \frac{3}{2-x^2}$.





21. Find the general solution of the following equations: $\sin x + \sin 3x + \sin 5x = 0$



22. Find the general solution of the following equations: $\cos 3x + \cos x - \cos 2x = 0$



23. Using principle of mathematical induction of prove that:

$$1+2+3+\ldots\ldots + n < rac{1}{8}(2n-1)^2 f \,\, ext{or} \,\, all n \in N$$

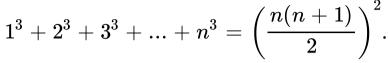


that:
$$1+2+3+\ldots\ldots+n=rac{n(n+1)}{2}$$

24. Use principle of mathematical induction to prove



25. Prove the following by using the principle of mathematical induction for all $n \in N$:-





26. Find n if ${}^{n-1}P_3$: ${}^nP_4 = 1:9$.



27. If m times the mth term is equal to n times the nth term of an A.P. prove that(m+n)th term of an A.P. is zero.

28. Without using the pythagorus, show that the points (4, 4), (3, 5) and (-1, -1) are the vertices of a right angled triangle.



29. Find the equation of a hyperbola whose vertices lie on y-axis, centre is at the origin, the distance between the foci is 16 and eccentricity is $\sqrt{2}$.



30. Find the derivative of $\frac{2}{x+1} - \frac{x^2}{3x-1}$.



Watch Video Solution

31. An integer is chosen from the first 200 integers.

Find the probability that it is divisible by 6 or 8.



Watch Video Solution

32. Find the squre root of $1+2\sqrt{6}i$.



33. Convert the complex number $-\sqrt{3}-i$ in the polar form. Also find their modulus and arguments.



Watch Video Solution

34. Solve the following system of unequalities graphically: $3x + 2y \le 12, x \ge 1, y = 2$.



Watch Video Solution

35. How many litres of water will have to be added to 1125 litres of the 45% solution of acid so that the resulting mixture will contain more than 25% but less than 30% acid content?



36. Find the derivative of xsinx



37. Find the derivative of $\frac{\sec x - 1}{\sec x + 1}$



38. Find the mean and variance of the first n natural numbers.



Watch Video Solution

39. Find the mean and variance of the following frequency distribution:

classes	0-30	30 - 60	60 - 90	90 - 120	120 - 150	150 - 180	180 - 210
frequency	2	3	5	10	3	5	2

