



MATHS

BOOKS - JBD PUBLICATION

MODEL PAPER (9)

Exercise

1. Which is the false statement?

A. $B - (a \cup C) = (B - C) - A$

B. $A - (B \cup C) = (A - C) - B$

C. $C - (B \cup A) = (C - B) - A$

D. $A - (B \cup C) = (B - C) - A$

Answer:



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2. If $f(x) = 4x - x^2$ for all $x \in R$, then the value of $f(a+1)-f(a-1)$ is:

A. $2(2-a)$

B. $3(2-a)$

C. $4(2-a)$

D. $3(a-1)$

Answer:



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3. The number of real solutions of the equations

$\cos^7 x + \sin^4 x = 1$ in the interval $[-\pi, \pi]$ is:

A. 1

B. 3

C. 4

D. none of these

Answer:



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4. If $\frac{1-i}{1+i} = x + iy$, then $x^2 + y^2$ is equal to:

A. 1

B. -1

C. 0

D. none of these

Answer:



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5. The number of permutations of all letters of word 'EXERCISES' is:

A. 40220

B. 30240

C. 20480

D. none of these

Answer:



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6. If $\sum n = 210$, then $\sum n^2$ is equal to:

A. 2870

B. 2670

C. 2570

D. none of these

Answer:



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7. Slope of the line which cuts off intercepts of equal length on the axis is?

A. -1

B. -2

C. 0

D. none of these

Answer:



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8. The equation of circle having centre (0,0) and area 154 sq. units.

A. $x^2 + y^2 = 16$

B. $x^2 + y^2 = 49$

C. $x^2 + y^2 = 20$

D. none of these

Answer:



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9. $\lim_{x \rightarrow 0} \frac{\sqrt{1+x} - 1}{x}$ is equal to:

A. 2

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

C. 1

D. none of these

Answer:



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10. Six boys and six girls sit in a row randomly. The probability that the six girls sit together or the the boys and girls sit alternatly, is

A. $\frac{1}{332}$

B. $\frac{1}{232}$

C. $\frac{1}{132}$

D. none of these

Answer:



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11. If $\cos \theta + \sin \theta = \sqrt{2} \cos \theta$, then show that $\cos \theta - \sin \theta = \sqrt{2} \sin \theta$.



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12. An angle α is divided into two parts such that ratio of the tangent of the parts is k. if difference of

two parts, prove that

$$\sin x = \frac{k-1}{k+1} \cdot \sin \alpha.$$



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13. Express $(5 - 3i)^3$ in the form $a + ib$.



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14. If the 2nd , 3rd and 4th terms in the expansion of $(x + y)^n$ are 240 , 720 and 1080 respansion find x , y and n .



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15. Find the middle terms in the expansion of

$$\left(3 - \frac{x^3}{6}\right)^7$$



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16. Three vertices of parallelogram ABCD are A(3,-1,2), B(1,2,-4), C(-1,1,2). Find the co-ordinate of the fourth vertex.



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17. Write down the truth value of the following:

The number 19 is prime.



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18. Write down the truth value of the following:

Every square is a rectangle.



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19. Write the contra positive of the following statements:

If you are born in India, then you are a citizen of India.



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20. Contrapositive of the statement If a number is divisible by 9. then it is divisible by 3 is



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21. Let A and B be two non empty sets, then show that $A \times B = B \times A$. If $A=B$



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22. Let $A=\{1,2,3\}$, $B=\{2,3,4\}$ and $C=\{4,5\}$.n verify that:

$$A \times (B \cup C) = (A \times B) \cup (A \times C)$$



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23. Prove that

$$\sin 7x + \sin 5x + \sin 3x + \sin x = 4 \cos x \cos 2x \sin 4x$$



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24. Using Principle of Mathematical Induction, prove that :

$$\cos \alpha \cos 2\alpha \cos 4\alpha \dots \cos (2^{n-1}\alpha) = \frac{\sin(2^n \alpha)}{2^n \sin \alpha}$$

for all $n \in \mathbb{N}$.



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25. Out of 18 points in a plane, no three are in the same straight line except 5 point which are collinear. Find the number of lines that can be formed by joining them?



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27. If $\frac{1}{6!} + \frac{1}{7!} = \frac{x}{8!}$, find x



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28. Find the sum to n terms of the sequence 8, 88, 888, 8888,...



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29. Find the equation of the line passing through the point $(-3, 2)$ which makes an angle 45° with the line $x - 2y = 3$.



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30. Find the equation of the circle passing through the points $(2,-3)$ and $(-1,1)$ whose centre is on the line $x - 3y - 11 = 0$.



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31. Evaluate: $\lim_{x \rightarrow 2} \frac{x^3 - 4x^2 + 4x}{x^2 - 4}$.



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32. Find the derivative of $(x + \sec x)(x - \tan x)$



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33. A single letter is selected at random from the word PROBABILITY the probability that it is a vowel is:



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34. If E and F are events such that $P(E) = \frac{1}{4}$, $P(F) = \frac{1}{2}$ and $P(E \text{ and } F) = \frac{1}{8}$. Find
(i) $P(E \text{ or } F)$ (ii) $P(\text{not } E \text{ and not } F)$.



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35. If E and F are events such that

$$P(E) = \frac{1}{4}, P(F) = \frac{1}{2} \text{ and } P(E \text{ and } F) = \frac{1}{8}. \text{ Find}$$

(i) $P(E \text{ or } F)$ (ii) $P(\text{not } E \text{ and not } F)$.



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36. If $(x + iy)^3 = u + iv$, then show that

$$\frac{u}{x} + \frac{v}{y} = 4(x^2 - y^2)$$



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37. Express $(5 - 3i)^3$ in polar form.



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38. Solve the inequalities given below for real x :-

$$\frac{(2x - 1)}{3} \geq \frac{(3x - 2)}{4} - \frac{(2 - x)}{5}$$

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39. Find all pairs of consecutive even positive integers, both of which are larger than 5 such that their sum is less than 23.

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40. Evaluate $\lim_{x \rightarrow 0} \frac{e^x - \sin x - 1}{x}$



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41. Find the derivative of $\tan x$



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42. The mean and variance of 8 observation are 9 and 9.25 respectively. If six of the observations are 6, 7, 10, 12, 12 and 13, find the remaining two observations.





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