MATHS

BOOKS - JBD PUBLICATION

MODEL PAPER (3)

Exercise

1. Let A={x: x is a positive multiple of 3 less than 100} and B={x: x is a prime number less than 20}, then n(A) + n(B) is equal to:

A. 23

B. 29

C. 33

D. 41

Answer:

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2. Range of function f(x)=1+3cos2x is:

A. (-2,4)

B. [-2,4)

C. [-2,4]

D. (-2,4]

Answer:

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3. The argument of $\frac{1-i}{1+i}$ is:

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

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

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

D. none of these

Answer:

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4. Number of ways in which is 8 boys can sit in a circle?

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5. If second term of a GP. is 2 and the sum of its infinte terms is 8, then its first term is

A. $\frac{1}{4}$

B. 4

C. 2

D. none of these

Answer:

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6. The line segment joining the points (1,2) and (-2,1) is divided by the line 3x+4y=7 in the ratio:

A. $4:9$

B. $9:4$

C. $2:3$

D. none of these

Answer:

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7. The length of the latus rectum of hyperbla $\frac{x^2}{9} - \frac{y^2}{16} = 1$ is:

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

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

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

D. none of these

Answer:

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8. $\lim_{x \to \frac{\pi}{2}} (\sec x - \tan x)$ is equal to:

A. 0

B. 1

C. 2

D. none of these

Answer:

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9. The probability of getting at least one tail in 4 tosses of a coin is:

A. $\frac{15}{16}$

B. $\frac{13}{16}$

C. $\frac{9}{16}$

D. none of these.

Answer:

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10. Find the principal and general solutions of the following equation:- $\operatorname{cosec} x = -2$

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11. Prove that $(\sin 3x + \sin x)\sin x + (\cos 3x - \cos x)\cos x = 0$

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12. Find te sum and product of the complex numbers $z_1 = -\sqrt{3} + \sqrt{-2}, z_2 = 2\sqrt{3} - i.$

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13. Find the term independent of x in the expanson of $\left[\frac{3}{2}x^2 - \frac{1}{3}x\right]^6.$

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14. Write the middle term in the expansion of $\left(x+\frac{1}{x}\right)^4$.

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15. Find the ratio in which the line segment joining the point (-2,4,7) and (3,-5,8) is divided by the yz-plane.

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16. Find out which of the following sentences are statements and which are not. Justify your answer.

Where is your bag?

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17. Find out which of the following sentences are statements and which are not. Justify your answer.

x+5=15.

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18. Check whether the following statement is true or not

If $x, y \in z$ are such that x and y are odd, then xy is odd.

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19. If A=[2,4,6,8], B=[6,8,10,12], find

$A \cap B$

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20. If A=[2,4,6,8], B=[6,8,10,12], find

$A - B.$

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21. If A=[2,4,6,8], B=[6,8,10,12], find

$B - A.$

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22. If $f(x) = x^2$ then find the value of $\frac{f(1.1) - f(1)}{1.1 - 1}$.

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23. Find the general solution for each of the following equations:

$4\sin^2\theta - 8\cos\theta + 1 = 0$

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24. Show that:

$sn10^\circ + \sin 20^\circ + \sin 40^\circ + \sin 50^\circ = \sin 70^\circ + \sin 80^\circ$

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25. Prove by the principle of mathematical induction:

$$1 + 2 + 3 + \ldots\ldots\ldots + n < \frac{1}{8}(2n+1)^2$$

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26. How many 3-digit even numbers can be made using the digits 1, 2, 3, 4, 6, 7, if no digit is repeated?

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27. How many chords can be drawn through 21 points on a circle?

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28. The sums of n terms of two arithmetic progressions are in the ratio $5n + 4 : 9n + 6$. Find the ratio of their 18th terms.

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29. The sum of two numbers is 6 times their G.M. show that numbers are in the ratio $3 + 2\sqrt{2} : 3 - 2\sqrt{2}$.

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30. Reduce the following equations of the line to slope intercept form and hence find

slope of the line

$x + \sqrt{3}y + 6 = 0$

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31. Reduce the following equations of the line to slope intercept form and hence find

the angle that the line make with X-axis.

$x + \sqrt{3}y + 6 = 0$

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32. Reduce the following equations of the line to slope intercept form and hence find

the angle that the line make with X-axis.

$x + \sqrt{3}y + 6 = 0$

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33. Verify that the locus of a point P which moves so that the sum of its distance from the points $S_1(-4, 0)$ and $S_2(4, 0)$ is 10, is an ellipse.

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34. Differetiate the function: $\frac{(x+2)(1-3x)}{2x+1}, x \neq -\frac{1}{2}$ w.r.t.x.

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35. Letters of the word "EDUCATION" are rearranged. Find the probability that the vowels are always together.

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36. Convert the following in the polar form : $\frac{1+7i}{(2-i)^2}$.

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37. Solve the following equation :- $x^2 + \frac{x}{\sqrt{2}} + 1 = 0$

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38. 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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39. Solve the inequalities given below:- $7 \leq \frac{(3x + 11)}{2} \leq 11$

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40. Solve the following inequalities:

$$-15 \leq \frac{3(x-2)}{5} \leq 0$$

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41. Evaluate:

$$\lim_{x \to \sqrt{2}} \frac{x^9 - 3x^8 + x^6 - 9x^4 - 4x^2 - 16x + 84}{x^5 - 3x^4 - 4x + 12}.$$

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42. Find the derivative of $(ax+b)^n$

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43. Coefficient of variation of two distributions are 60% and 70% and their standard deviations are 21 and 16 respectively. What are their arithmetic means?

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