MATHS

BOOKS - JBD PUBLICATION

MODEL PAPER (8)

Exericse

1. Set of even prime number is a

A. infinite set

B. null set

C. a singleton set

D. not a set

Answer:

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2. If the function $f: R \to A$, given by $f(x) = \frac{e^x - e^{-|x|}}{e^x + e^{|x|}}$ is surjection, find A.

A. (0,1]

B. (0,1)

C. (0,1]

D. [0,1)

Answer:

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3. If the angles of a triangle are in the ratio 3:4:5, then the greatest angle in radians is:

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

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

C. $\frac{5\pi}{12}$

D. none of these

Answer:

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4. The polar form of the complex number $\left(i^{25}\right)^3$ is

A. $\frac{\cos\pi}{2} + i\frac{\sin\pi}{2}$

B. $\cos \pi + i \sin \pi$

C. $\cos \pi - i \sin \pi$

D. $\frac{\cos \pi}{2} - i \frac{\sin \pi}{2}$

Answer:

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5. $\hat{} \ nP_5 = 20.^n P_3$, then n is equal to:

A. 8

B. 9

C. 10

D. none of these

Answer:

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6. G.M of 8 and 18 is:

A. 13

B. 26

C. 10

D. 12

Answer:

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7. The value of λ for which the lines 3x+4y=5, 5x+4y=4 and $\lambda x + 4y = 6$ meet at a point is:

A. 2

B. 1

C. 3

D. none of these

Answer:

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8. The equation

$$16x^2 + y^2 + 8xy - 74x - 78y + 212 = 0$$

represents:

A. a circle

B. a parabola

C. an ellipse

D. a hyperbola

Answer:

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9. If $y = \frac{\sin x}{1 + \cos x}$, then value of $\frac{dy}{dx}$ is:

A. $\frac{1}{1 + \sin x}$

B. $-\sin x$

C. $\frac{1}{1 + \cos x}$

D. none of these

Answer:

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10. In a single toss of three coins, the probability of getting head and tail alternatively is:

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

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

C. $\frac{1}{8}$

D. none of these.

Answer:

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11. Find the angle between the minute hand and the hour hand of a clock when the time is 7.20.

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12. Prove that: tan3A. tan2A. tanA=tan3A-tan2A-tanA

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13. Find the real numbers x and v if $(x - iy)(3 + 5i)$ is the conjugate of $-6 - 24i$.

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14. Prove that the coefficient of x^n in $(1+x)^{2n}$ is twice the coefficient of x^n in $(1+x)^{2n-1}$

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15. Write the middle term in the expansion of $\left(2x^2 - \frac{1}{x}\right)^{10}$.

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16. A point R with x-co-ordinate 4 lies on the line segment joining the points P(2,-3,4) and Q(8,0,10). Find the co-ordinate of the point R.

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

2 is an even number.

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

How are you?

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19. Rewrite the following statement if then in five different ways conveying the same meaning

If a natural number is odd, then its square is also odd.

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20. There are 210 members in a club. 100 of them drink tea and 65 drink tea but not coffee. How many drink coffee but not tea?

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21. If y=$f(x) = \frac{2x+3}{5x-2}$, prove that f(y)=x.

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22. If $\sin\theta = n\sin(\theta + 2\alpha)$, show that : $\tan(\theta + \alpha) = \frac{1+n}{1-n}\tan\alpha.$

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23. Prove by mathematical induction that

$1 + 3 + 3^2 + \ldots\ldots\ldots\ldots + 3^{n-1} = \frac{3^n - 1}{2}$

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24. Find the number of words which can be made by using all the letters of the word "AGAIN" if these words are written as in dictionary. What will be the 50th word?

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25. If $C(n,10)=C(n,12)$, determine n and hence $C(n,5)$.

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26. The A.M. between two positive numbers is 34 and their G.M. is 16. find the numbers.

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27. If $\frac{a^n + b^n}{a^{n-1} + b^{n-1}}$ is the A.M. between a and b, then find the value of n.

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28. Find the equations of the lines, which pass through the point (4, 5) and make equal

angles with the lines 5x -12y + 6 = 0 and 3x = 4y + 7.

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29. Find the area of the triangle formed by the lines joining the vertex of the parabola $x^2 = 12y$ to the ends of its latus rectum.

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30. Evaluate: $\lim_{x \to 1} \frac{3x^2 - 2x - 10}{x^2 - 4}$.

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31. Find the derivative of $\frac{x^n - a^n}{x - a}$ for some constant a, x $\neq$ a.

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32. A card is drawn from a well shuffled pack of 52 cards. Find the probability that is it:

a king or an ace.

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33. A card is drawn from a well shuffled pack of 52 cards. Find the probability that is it:

neither a heart nor a king.

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34. If z=x+iy and $\left|\frac{z-3}{z+3}\right| = 2$, show that $x^2 + y^2 + 10x + 9 = 0.$

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35. If $\frac{1-7i}{(2i)^2}$= a+ib, then find the value of a and b.

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36. Give the graphical solution of the following system of inequalities:

$2x + y \leq 24, \quad x + y \leq 11, \quad 2x + 5y \leq 40,$

$x, y \geq 0.$

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37. Find all pairs of positive integers such that their sum is less than 8 and their difference is 2.

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38. Evaluate $\lim_{x \to 0} \frac{\sin ax + bx}{ax + \sin bx}$

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39. Find the derivative secx w.r.t x

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40. The mean and standard deviation of 20 observations are found to be 10 and 2 respectively. On rechecking, it was found that an observation 8 was incorrect. Calculate the correct mean and standard deviation if wrong item is omitted.

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41. The mean and standard deviation of 20 observations are found to be 10 and 2 respectively. On rechecking, it was found that an observation 8 was incorrect. Calculate the correct mean and standard deviations in each of the following cases:

If it is replaced by 12.

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