MATHS

BOOKS - JBD PUBLICATION

MODEL PAPER (7)

Exercise

1. The set {x:x is an integer and $-3 < x \le 2$} is equal to:

A. {-2,-1,0,1,2}

B. {-3,-2,.........,2}

C. ϕ

D. `{-2,-1,0,1}

Answer:

2. The range of the function $f(x) = \dfrac{x^2 + x + 2}{x^2 + x + 1}$, $x \in R$, is

(a) $(1, \infty)$ (b) $\left(1, \dfrac{11}{7}\right)$ (c) $\left(1, \dfrac{7}{3}\right)$ (d) $\left(1, \dfrac{7}{5}\right)$

A. $(1, \infty)$

B. $\left(1, \dfrac{11}{7}\right)$

C. $\left(1, \dfrac{7}{3}\right)$

D. $(1, 7.5)$

Answer:

3. If $\sin(\alpha + \beta) = 1,$ $\sin(\alpha - \beta) = \dfrac{1}{2},$ then $\tan(\alpha + 2\beta)\tan(2\alpha + \beta)$ is equal to:

A. 1

B. -1

C. 2

D. -2

Answer:

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4. The conjugate of $\dfrac{1}{2 + i}$ is

A. $\dfrac{2 + i}{5}$

B. $\dfrac{2 - i}{5}$

C. $\dfrac{i-2}{5}$

D. $-\dfrac{2+i}{5}$

Answer:

5. The number of straight lines that can be formed by joining 20 points of which 4 points are collinear is:

A. 183

B. 197

C. 185

D. 195

Answer:

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

    A. 4

    B. -4

    C. 2

    D. -2

Answer:

7. The point on the axis of y which its equidistant from (-1, 2) and (3, 4), is

   A. (0,5)

   B. (5,0)

   C. (-5,0)

   D. none of these

Answer:

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8. The equation of the parabola with focus at (0, 3) and the directrix y + 3 = 0 is

   A. $y^2 = 12x$

B. $x^2 = 12y$

C. $x^2 = -12y$

D. $y^2 = -12y$

Answer:

9. $\lim\limits_{x \to 5} \dfrac{|x - 3|}{x - 3}$ is equal to:

A. 1

B. 2

C. 3

D. 5

Answer:

10. If A and B are events such that P(A) = 0.42, P(B) = 0.48 and

P(A ∩ B) = 0.16, then P(A or B) is equal to

A. 0.2

B. 0.96

C. 0.86

D. 0.74

Answer:

11. The minute hand of a watch is 1.5 cm long. How many cm does its extremity move in 40 minutes ? (Use $\pi = 3.14$)

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12. Prove that: $2\dfrac{\sin^2(3\pi)}{4} + 2\dfrac{\cos^2\pi}{4} + 2sec^2\dfrac{\pi}{3} = 10$

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13. If $a + ib = \dfrac{(x + i)^2}{2x^2 + 1}$, prove that $a^2 + b^2 = \dfrac{(x^2 + 1)^2}{(2x^2 + 1)^2}$.

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14. Using Binomial theorem, prove that $6^n - 5n$ always leaves remainder 1 when divided by 25.

15. Write the middle term of $\left(x - \dfrac{1}{x} \right)^{2n}$.

16. Find the equation of the set of points P, the sum of whose distance from A(4,0,0) and B(-4,0,0) is equal to 10.

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

Listern to me John?

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

2+3<6

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19. Write each of the statement in the form if p and then q

p: It is necessary to have a password to log on to the server.

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20. Write each of the following statements in the form "if p then q"

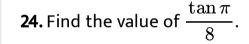q: There is traffic Jam whenever it rain.

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21. Taking the set of natural numbers as the universal set, write down the complements of the following set: { x : x is a prime number }

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22. Find the domain of the function $f(x) = \dfrac{x^2 + 2x + 1}{x^2 - 8x + 12}$.

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23. If $\cos x = -\dfrac{1}{3}$, x lies in IIIrd quadrant, find the value of $\dfrac{\sin x}{2}$, $\dfrac{\cos x}{2}$, $\dfrac{\tan x}{2}$.

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24. Find the value of $\dfrac{\tan \pi}{8}$.

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25.

$1.3 + 3.5 + 5.7 + \ldots\ldots + (2n-1)(2n+1) = \dfrac{n(4n^2 + 6n - 1)}{3}$

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26. Determine n if $^{2n}C_3 : {}^nC_3 = 11:1$

27. In an A.P., if p^{th} term is $\dfrac{1}{q}$ and q^{th} term is $\dfrac{1}{p}$, prove that the sum of first pq terms is $\dfrac{1}{2}(pq + 1)$, where $p \neq q$.

28. Find angles between the lines $\sqrt{3}x + y = 1$ and $x + \sqrt{3}y = 1$.

29. Find the equation of a circle passing through the points (5, 7), (6, 6) and (2, - 2). Also find its centre and radius.

30. Evaluate: $\lim\limits_{x \to 0} \dfrac{e^{\log(1+2x)}}{x}$

31. Find the derivative of
$x^5 \left(3 - 6x^{-9}\right)$.

32. Given $P(A) = \dfrac{3}{5}$ and $P(B) = \dfrac{1}{5}$. Find the $P(A \cup B)$ if A and B are mutually exclusive events.

33. 4 cards are drawn from a well shuffled deck of 52 cards. What is the probability of obtaining 3 diamonds and one spade ?

34. Prove that $|z| = |-z|$

35. Find the cube roots of unity.

36. The longest side of a triangle is 3 times the shortest side and the third side is 2 cm shorter than the longest side. If the perimeter of the triangle is at least 61 cm, find the minimum length of the shortest side.

37. A manufacture has 600 litres of a 12% solution of acid .How many litres of a 30% acid solution must be added to it so that acid content in the resulting mixture will be more than 15% but less than 18% ?

38. Evaluate $\lim\limits_{r \to 1} \pi r^2$

39. Find the derivative of $\dfrac{2}{x + 1}$

40. Calculate the mean deviation about median age for the age distribution of 100 persons given below :

Age	16—20	21—25	26—30	31—35	36—40	41—45	46—50	51—55
Number	5	6	12	14	26	12	16	9.

41. The diameters of circle (in mm) drawn in a design are given below.calculate S.D and mean diameter:

Diameter (in mm)	33 – 36	37 – 70	41 – 44	45 – 48	49 – 52
No. of circles	15	17	21	22	25

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