



MATHS

BOOKS - S CHAND MATHS (ENGLISH)

SELF ASSESSMENT PAPER 2

Section A Questions

1. Domain of the function $f(x) = \frac{1}{\log(2-x)}$ is

- A. $f(x) = (-\infty, 2)$
- B. $f(x) = (-\infty, 2) \setminus \{1\}$
- C. $f(x) = (\infty, -2)$
- D. $f(x) = (-\infty, -2)$

Answer:

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2. The value of $\cos 210^\circ$ is

A. 1

B. -1

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

D. $-\frac{\sqrt{3}}{2}$

Answer: A::B::C

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3. The value of $\cos(\pi + x)\sin(\pi - x)\sec x \cdot \cos esx$ is

A. 0

B. 1

C. -1

D. Not defined

Answer:



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4. The conjugate of $\frac{1}{1 - 2i}$ is

A. $\frac{1}{5} - \frac{2i}{5}$

B. $\frac{1}{5} + \frac{2i}{5}$

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

D. $\frac{2}{5} + \frac{2i}{5}$

Answer:



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5. If α and β are the roots of the quadratic equation $ax^2 + bx + 1$, then the value of $\frac{1}{\alpha\beta} + (\alpha + \beta)$ is

A. $\frac{a^2 + b}{a}$

B. $\frac{a^2 - b}{a}$

C. $\frac{a^2 + b}{b}$

D. $\frac{a^2 - b}{b}$

Answer:



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6. The number of terms in the terms of $(2x + 5)^6 + (2x - 5)^6$ is

A. 4

B. 5

C. 6

D. 7

Answer:



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7. The first term of a G.P. with real term is 2. If the sum of its third and fifth terms is 180, the common ratio of the G.P. is

A. 0

B. ± 1

C. ± 2

D. ± 3

Answer:



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8. If the origin is shifted to $(1, 6)$, then the new co-ordinates of $(-3, 4)$ will be

A. $(-1, -2)$

B. $(-4, -2)$

C. $(2, 3)$

D. $(3, -5)$

Answer:



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9. The equation of the circle with centre $(0, 6)$ and radius 3 is

A. $x^2 + y^2 - 12y + 27 = 0$

B. $x^2 + y^2 - 12y - 27 = 0$

C. $x^2 + y^2 + 12y + 27 = 0$

D. $x^2 + y^2 + 12y - 27 = 0$

Answer:



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10. $\lim_{x \rightarrow 5} \frac{\sqrt{x+5} - \sqrt{x-5}}{x+5}$ is equal to

A. $\sqrt{10}$

B. $\frac{1}{\sqrt{10}}$

C. $-\sqrt{10}$

D. $-\frac{1}{\sqrt{10}}$

Answer:



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11. Solve the linear inequality $|x - 2| \geq 6$.

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12. Evaluate $\lim_{x \rightarrow 0} \left[\frac{4 \sin x - 9x \cos x}{3x^2 - 5 \tan x} \right]$

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13. The English alphabet has 5 vowels and 21 consonants. How many words with 2 different vowels and 2 different consonants can be formed from the alphabet?

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14. If A and B are two events such that $P(A) = \frac{1}{4}$, $P(B) = \frac{1}{2}$ and $P(A \cap B) = \frac{1}{8}$. Then, find $P(\text{not } A \text{ and not } B)$.

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15. Find the real values of x and y , if $(3m - 2i)(2 + i)^2 = 10(1 + i)$

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16. Write down the power set of the following sets.

$$B = \{0, 1, 3\}$$

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17. Write down the power set of the following sets.

$$C = \{1, \{2\}\}$$

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18. If $A = \{1, 3, 5, 7\}$, $B = \{2, 4, 6, 8, 10\}$ and let $R = \{(1, 8), (3, 6), (5, 2), (1, 4)\}$ be a relation from A to B. Then,

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19. Prove that $\frac{1 - \cos 2A + \sin 2A}{1 + \cos 2A + \sin 2A} = \tan A$

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20. Find the value of $\sqrt{3} \cos ec 20^\circ - \sec 20^\circ$

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21. Prove that $\cos^2 x + \cos^2\left(x + \frac{\pi}{3}\right) + \cos^2\left(x - \frac{\pi}{3}\right) = \frac{3}{2}$.

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22. Find the coefficient of x^6 in the expansion of $(1 - 2x)^{-5/2}$.

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23. If the term free from x in the expansion of $\left(\sqrt{x} - \frac{k}{x^2}\right)^{10}$ is 405, then find the value of k .

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24. Evaluate the left hand and right hand limits of the function defined by

$$f(x) = \begin{cases} 1 + x^2, & \text{if } 0 \leq x \leq 1 \\ 2 - x^2, & \text{if } x > 1 \end{cases} \quad \text{at } x = 1$$

also, show that $\lim f(x)$ does not exist.

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25. Prove that
$$\frac{\cos(90^\circ + \theta)\sec(270^\circ + \theta)\sin(180^\circ + \theta)}{\cos ec(-\theta)\cos(270^\circ - \theta)\tan(180^\circ + \theta)}$$

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26. Prove that
$$\frac{\cos 4x + \cos 3x + \cos 2x}{\sin 4x + \sin 3x + \sin 2x} = \cot 3x$$

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27. Using the principle of mathematical induction, prove that $n(n + 1)(n + 5)$ is a multiple of 3 for all $n \in N$.

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28. $(\lim)_{x \rightarrow 0} \frac{ax + x \cos x}{b \sin x}$



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29. If $y = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \dots + \frac{x^n}{n!}$, then show that $\frac{dy}{dx} + \frac{x^n}{n!} = y$



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30. Solve: $\frac{x^2 - 2x + 5}{3x^2 - 2x - 5} > \frac{1}{2}$.



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31. Find the value of p , such that the difference of the roots of the equation $x^2 - px + 10 = 0$ is 3. If the roots of $x^2 - px + 10 = 0$

are α, β find the quadratic equation whose roots are $(\alpha + \beta)^2$ and $\alpha^2\beta - \alpha\beta^2$.

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32. The sum of an infinite geometric series is 15 and the sum of the squares of these terms is 45. Find the series.

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33. Find the angle between the lines $y = (2 - \sqrt{3})(x + 5)$ and $y = (2 + \sqrt{3})(x - 7)$

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34. Find the equation of the circle which passes through the centre of the circle $x^2 + y^2 + 8x + 10y - 7 = 0$ and is concentric with the

circle $2x^2 + 2y^2 - 8x - 12y - 9 = 0$



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35. The marks obtained by a student in his annual examination in various subjects are given below:

Subject	Hindi	Mathematics	English	Science	S.Studies
Marks obtained	64	40	52	80	36

Represent the above data by a bar graph.



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Section B Questions

1. The eccentricity of the ellipse $\frac{x^2}{36} + \frac{y^2}{25} = 1$ is

A. $\frac{11}{6}$

B. $-\frac{11}{6}$

C. $-\frac{\sqrt{11}}{6}$

D. $\frac{\sqrt{11}}{6}$

Answer:



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2. The distance of the point (4, 5, 6) from the XZ plane is (a)2 units
(b)3 units (c)4 units (d)5 units

A. 2 units

B. 3 units

C. 4 units

D. 5 units

Answer:



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3. Find the equation of parabola whose focus is $(0, -7)$ and directrix $y = 7$.

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4. Find the equation of the hyperbola whose foci are $(\pm 5, 0)$ and vertices are $(\pm 3, 0)$.

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5. Write the negation of the statement, p : Mumbai is the economic capital of India.

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6. Construct the truth table for compound statement $(p \wedge q) \wedge \sim p$

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7. Prove that statement by contradiction method. The sum of an irrational and a rational number is irrational.

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8. Find the ellipse if its foci are $(\pm 2, 0)$ and the length of the latus rectum is $\frac{10}{3}$.

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9. Find the equation of hyperbola with centre at origin, transverse axis along x axis, eccentricity $\sqrt{5}$ and sum of whose semi axis is 9.



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10. The midpoint of the sides of a triangle are $(1, 5, -1)$, $(0, 4, -2)$ and $(2, 3, 4)$. Find its vertices.



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Section C Questions

1. The wholesale price index (or price relative) of carrots in 2018 compared to 2019 is 150. If the cost of carrots was ₹50 per kg in 2018, calculate the cost in 2019.



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2. When the number of observations (n) is odd, then median is equal to

A. $n/2$

B. $(n + 1)/2$

C. n^2

D. $n + 1$

Answer:

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3. In a class of 15 students, 4 students failed and those who passed had marks 38, 45, 63, 35, 81, 99, 78, 57, 92, 39, 48. Find the median marks of the class.

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4. Find the Q_1 for the following distribution. 20, 27, 25, 32, 36, 24, 26.

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5. The weights (in kilogram) of 15 students are as follows :

31, 35, 27, 29, 32, 43, 37, 41, 34, 28, 36, 44, 45, 42, 30

Find the median. If the weight 44 kg is replaced by 46 kg and 27 kg by 25 kg, find the new median.

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6. An examination is taken at three centres each of which has 100 candidates. The mean marks and standard deviation for each centre are given below.

(Ist"centre", 45, 9.6), (IInd"centre", 50, 10.8),

(III^(rd)"centre",43,9.0):}

Calculate the standard deviation of all 300 candidates.



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7. Calculate the coefficient of correlation between two variables x and y for 12 pairs of observation, the following data was obtained.

$$\Sigma x = 20, \Sigma y = 6, \Sigma x^2 = 650, \Sigma y^2 = 280, \Sigma xy = 330$$

On rechecking, it was found that one pair $(12, 8)$ was wrongly copied while the correct pair being $(9, 13)$. find the correct value of coefficient of correlation.



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8. A psychologist selected a random sample of 20 students. He grouped them in 10 pairs so that the students in each pair have nearly equal scores in an intelligence test. In each pair, one student

was taught by method A and the other by method B and examined after the course. The marks obtained by them after the course are as follows.

Pairs	Method A	Method B
1	34	38
2	36	43
3	28	39
4	34	45
5	40	43
6	30	50
7	34	52
8	28	39
9	32	40
10	42	42

Calculate spearman's Rank

correlation



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