



MATHS

BOOKS - S CHAND MATHS (ENGLISH)

SAMPLE QUESTION PAPER 01

Section A

1. The domain of the function $f(x) = \sqrt{9 - x^2}$ is :

- A. $\{ - 3 \leq x \leq 3 \}$
- B. $\{ x \leq - 3 \text{ and } x \geq 3 \}$
- C. $\{ x \geq 3 \}$
- D. $\{ - 3 \leq x \}$

Answer: A



2. Solve : $\tan\left(\frac{\pi}{4} + \theta\right) + \tan\left(\frac{\pi}{4} - \theta\right) = 4$

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

B. $\frac{\pi}{6}$

C. $\frac{\pi}{4}$

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

Answer: B



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3. If $\theta = 4530^\circ$, then $\sin 4530^\circ$ is :

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

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

C. $\frac{1}{\sqrt{2}}$

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

Answer: B



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4. The third term of a G.P. is 2. Then product of the first five terms, is :

A. 32

B. 64

C. 16

D. 128

Answer: A



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5. If α and β are roots of the equation $x^2 - 2x + 1 = 0$, then the value of $\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$ is

A. 4

B. 1

C. 2

D. 0

Answer: C



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6. If the coefficients of x^2 and x^3 in the expansion of $(3 + ax)^9$ be same, then the value of a is

A. $\frac{3}{7}$

B. $\frac{7}{9}$

C. $\frac{9}{7}$

D. $\frac{7}{3}$

Answer: C



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7. If $1, \omega, \omega^2$ are cube roots of unity then the value of $(3 + 5\omega + 3\omega^2)^3$ is

A. 6

B. 8

C. 12

D. 16

Answer: B



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8. The point diametrically opposite to the point $(-3, -4)$ on the circle $x^2 + y^2 + 2x + 4y - 3 = 0$ is :

A. $(3, -4)$

B. $(-3, 4)$

C. $(1, 0)$

D. $(3, 4)$

Answer: C



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9. A straight line that has equal intercepts on axes but opposite in magnitude and passing through the points $(3, 2)$ is :

A. $x - y = 1$

B. $x + y = 1$

C. $-x + y = 1$

D. $x + y = -1$

Answer: A



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10. $\lim_{x \rightarrow (\pi)} \frac{\sin x}{x - \pi}$ is equal to

A. 0

B. 1

C. -1

D. None of the above

Answer: C



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11. Find the numbers x and y if $(x + 3, y - 6) = (5, 5)$.

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12. How many 4-digit numbers are there with no digit repeated?

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13. Find the middle term in the expansion of $\left(\frac{x}{y} + \frac{y}{x}\right)^{10}$.

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14. Find the derivative of $f(x) = 2x^2 + 4x + 5$ at $x = 2$.

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15. A family has exactly 4 children. Assuming that each child born is equally likely to be boy or girl, then what is the sample space that the event to having exactly one girl child?

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16. If $A = \{1, 2, 3, 4, 5, 6\}$ $B = \{2, 4, 5, 6, 8, 9, 10\}$, find $A \Delta B$.

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17. In a class of 35 students, 24 like to play cricket and 16 like to play football. Also, each student likes to play at least one of the two games.

How many students like to play both cricket and football ?

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18. Prove that : $\frac{\cos 2A}{1 + \sin 2A} = \tan\left(\frac{\pi}{4} - A\right)$

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19. In any $\triangle ABC$, prove that

$$\frac{\sin A}{\sin(A + B)} = \frac{a}{c}$$

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20. If $\tan \alpha = -2$, find the value of $\sin \alpha$ (α lies in the II Quadrant).

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21. If $\frac{2 + 3i}{3 - 4i} = a + ib$, find the values a and b .

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22. If α and β are roots of the equation $x^2 + kx + 12 = 0$ and $\alpha - \beta = 1$, find k .

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23. Find the domain and range of : $2 - |x - 4|$.

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24. Solve : $\sin 7x + \sin 4x + \sin x = 0$ and $0 < x < \frac{\pi}{2}$

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25. Prove that $\frac{\cos A + \cos 3A + \cos 5A + \cos 7A}{\sin A + \sin 3A + \sin 5A + \sin 7A} = \cot 4A$

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26. Using Mathematical induction, prove that $10^n + 3 \cdot 4^{n+2} + 5$ is divisible by 9 for all $n \in \mathbb{N}$.

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27. Differentiate the function $\sin(2x - 3)$ by First Principle of differentiation.

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28. Evaluate : $\lim_{x \rightarrow 0} \frac{(1 - x)^n - 1}{x}$

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29. If 'x' be real, find the maximum and minimum value of :

$$y = \frac{x + 2}{2x^2 + 3x + 6}$$

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30. If α, β be the roots of the equation $x^2 + lx + m = 0$, then from an equation whose roots are : $(\alpha + \beta)^2$ and $(\alpha - \beta)^2$

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31. The sum of three consecutive numbers of a G.P is 56. If we subtract 1, 7 and 21 from these numbers in the order the resulting numbers form an A.P. Find the numbers.

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32. Find the equation of the circle which passes through the points $(2, 3)$, $(4, 5)$ and the centre lies on the straight line $y - 4x + 3 = 0$.

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33. Find the equation of acute angled bisector of lines :

$$3x - 4y + 7 = 0 \text{ and } 12x - 5y - 8 = 0$$

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34. Find the mean and standard deviation of the following frequency distribution :

Marks	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34
No. of students	2	5	7	13	21	16	8

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Section B

1. In the ellipse $\frac{x^2}{6} + \frac{y^2}{8} = 1$, the value of eccentricity is

- A. $\frac{1}{2}$
- B. $\frac{2}{3}$
- C. $\frac{1}{3}$
- D. $\frac{3}{2}$

Answer: A

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2. If the distance between the points $(a, 2, 1)$ and $(1, -1, 1)$ is 5, then value of a are :

A. $-5, -3$

B. $5, -3$

C. $-5, 3$

D. $5, 3$

Answer: B



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3. Find the equation of the hyperbola whose foci are $(0, \pm 6)$ and conjugate axis is $2\sqrt{11}$.



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4. If the line $y = mx + 1$ is tangent to the parabola $y^2 = 4x$, then find the value of m .

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5. Write the converse of the statement. If a number is divisible by 9, then it is divisible by 3.

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6. Construct the truth table for the compound proposition $(\sim p \vee q)$

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7. Show that the statement : ' if $x + 3 = 9$, then $x = 6$ ' is truth by method of contrapositive.

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8. Find the equation of the ellipse in the following case: focus is (1,2), directrix is $3x + 4y - 5 = 0$ and $e = \frac{1}{2}$.



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9. Find the centre, focus, eccentricity and length of latus rectum of the hyperbola $16x^2 - 9y^2 = 144$.



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10. In what ratio the point P(-2, y, z) divides the line joining the points A(2, 4, 3) and B(-4, 5, -6). Also, find the coordinates of point P.



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1. The price index of a commodity is 140. Then, the percentage increase in price of the commodity in current year as compared to the base year is :

- A. (i) 4 %
- B. (ii) 40 %
- C. (iii) 20 %
- D. (iv) 10 %

Answer: B



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2. Q_1 is always equal to :

- A. (i) P_1
- B. (ii) P_{10}
- C. (iii) P_{25}
- D. (iv) P_{50}

Answer: C



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3. Find the Q_1 and Q_3 for the following distribution : 5, 3, 6, 3, 13, 9, 8, 24, 19, 20, 18.



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4. Find D_7 of the distribution x_1 : 18, 20, 9, 15, 21, 26, 14, 13, 27, 22, 16, 28.



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5. If a machine costs Rs 10000/- in the year 2005 and Rs 18000/- in the year 2008, then find the price relative.



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6. The mean weight of 150 students in a certain class is 60 kg. The mean weight of boys is 70 kg and that of girls in the class is 55 kg. Find the number of boys and girls in the class.

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7. Find the correlation coefficient $r(x,y)$ if :

$$n = 10, \sum x = 60, \sum y = 60, \sum x^2 = 400, \sum y^2 = 580, \sum xy = 305$$

.

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8. Find the Karl Pearson's coefficient of correlation between X and Y for the following data :

X	5	4	3	2	1
Y	4	2	10	8	6

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