



MATHS

BOOKS - S CHAND MATHS (ENGLISH)

SAMPLE QUESTION PAPER 4

Section A

1. If $f(x) = \frac{x - |x|}{|x|}$, then value of $f(-1)$ is

A. 1

B. -1

C. 2

D. -2

Answer: D



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2. If $\cos ec\theta = \frac{5}{3}$, then the value of $\tan\theta + \cot\theta$ is

A. $11/25$

B. $12/25$

C. $25/11$

D. $25/12$

Answer: D



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3. The value of $\tan 225^\circ$ is

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4. The conjugate of $\frac{1}{4 + 5i}$ is

A. $\frac{4}{41} - \frac{5i}{41}$

B. $\frac{4}{41} + \frac{5i}{41}$

C. $\frac{5}{41} - \frac{4i}{41}$

D. $\frac{5}{41} + \frac{4i}{41}$

Answer: B

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5. If α and β are the roots of the quadratic equation

$px^2 + qx + 1$, Then the value of $\alpha\beta + \alpha^2\beta^2$ is

A. $\left(1 + \frac{1}{q}\right)$

B. $\left(1 + \frac{1}{p}\right)$

C. $\frac{1}{q}\left(1 + \frac{1}{q}\right)$

D. $\frac{1}{p}\left(1 + \frac{1}{p}\right)$

Answer: D

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6. The number of terms in the expansion of $(1 + 8y + 16y^2)^{25}$ is

A. 49

B. 50

C. 51

D. 52

Answer: C



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7. Find the 12^{th} term of a G.P. whose 8th term is 192 and the common ratio is 2.

A. 3070

B. 3071

C. 3072

D. 3073

Answer: C



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8. If the vertices of a triangle are $(1, k)$, $(4, -3)$ and $(-9, 7)$ and its area is 15 sq. units, then the value(s) of k is

A. $-3, 21/13$

B. $-3, -21/13$

C. $3, 21/13$

D. $3, -21/13$

Answer: A



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9. The equation of the circle with centre $(0, 5)$ and radius 5 is

A. (i) $x^2 + y^2 - 10 = 0$

B. (ii) $x^2 + y^2 + 10 = 0$

C. (iii) $x^2 + y^2 - 10y = 0$

D. (iv) $x^2 + y^2 + 10y = 0$

Answer: C



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10. $\lim_{x \rightarrow 1} \frac{\sqrt{1+x} - \sqrt{1-x}}{1+x}$ is equal to

A. (i) $\frac{1}{\sqrt{3}}$

B. (ii) $\frac{1}{\sqrt{2}}$

C. (iii) $\sqrt{3}$

D. (iv) $\sqrt{2}$

Answer: B





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11. In how many ways can a party of 4 boys and 4 girls be seated at a circular table so that no 2 boys are adjacent?



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12. Differentiate $x^2 \tan x$.



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13. Two cards are drawn at random from a pack of 52 cards. What is the probability that both the drawn cards

are aces?



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14. Find the value of x for which the points $(x, -1)$, $(2, 1)$ and $(4, 5)$ are collinear.



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15. Expand $(3x - 2y)^4$



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16. Show that ϕ , $\{0\}$ and 0 are all different.



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17. Express $\{(x, y) : x^2 + y^2 = 25 \text{ where } x, y \in W\}$ as a set of ordered pairs.



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18. In a ΔABC , if $\angle A = 45^\circ$, $\angle B = 60^\circ$ and $\angle C = 75^\circ$, find the ratio of its sides.



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19. If $\cos x = \frac{4}{5}$ and x is acute, find the value of $\tan 2x$.

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20. about to only mathematics

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21. Express $(4 - 3i)^3$ in the form $(a + ib)$.

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22. Solve the equation $\sqrt{3}x^2 - \sqrt{2}x + 3\sqrt{3} = 0$



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23. Find the domain of $f(x) = \frac{1}{\sqrt{x + |x|}}$



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24. Prove that :

$$s \in x + s \in 3x + s \in 5x + s \in 7x = 4 \cos x \cos 2x \sin 4x$$



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25. If $\frac{\tan x}{2} = \frac{m}{n}$, then write the the value of $m \sin x + n \cos x$.

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26. Prove the following using principle of mathematical induction. $3^{2n+2} - 8n - 9$ is divisible by 8.

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27. Find the derivative of $\left(\frac{x+1}{x-1}\right)$ using first principle of differentiation.

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28. Evaluate $\lim_{x \rightarrow 0} \frac{(\sqrt{1+3x} - \sqrt{1-3x})}{x}$

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29. If $x + iy = \sqrt{\frac{a + ib}{c + id}}$ prove that

$$(x^2 + y^2)^2 = \frac{a^2 + b^2}{c^2 + d^2}$$

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30. Find real θ such that $\frac{3 + 2i \sin \theta}{1 - 2i \sin \theta}$ is purely real.

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31. The sum of an infinite G.P is 57 and the sum of their cubes is 9747, then the common ratio of the G.P is



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



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33. Find the equation of the line parallel to y-axis and drawn through the point of intersection of the lines $x - 7y + 5 = 0$ and $3x + y = 0$.



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34. Calculate the mean and standard deviation for the following data: Wages upto (into Rs.), 15, 30, 45, 60, 75, 90, 105, 120 No. of workers, 12, 30, 65, 107, 157, 202, 222, 230



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Section B

1. The distance between the directrices of the ellipse

$$\frac{x^2}{36} + \frac{y^2}{20} = 1 \text{ is}$$

A. 16 units

B. 17 units

C. 18 units

D. 19 units

Answer: A



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2. The ratio in which the line segment joining the points $(2, 4, -3)$ and $(-3, 5, 4)$ divided by XY-plane is

A. 3 : 4 internally

B. 4 : 5 externally

C. 2 : 6 internally

D. 6 : 7 externally

Answer: A::B::C::D



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3. Find the equation of the parabola with vertex at $(0,0)$ and focus at $(0,3)$.



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4. Find the equation of the hyperbola whose foci are $(\pm 3, 0)$ and vertices $(\pm 2, 0)$.



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5. Write the negation of the statement "New Delhi is in India and Colombo is in Sri Lanka".



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6. Check the validity of the following statement. If x and y are odd integers, then xy is an odd integer.



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7. Write the negation of the following statement. If I become a doctor then I will open a hospital.



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8. Show that the equation

$$3x^2 + 4y^2 - 12x - 8y + 4 = 0 \text{ represents an ellipse.}$$

Find the focus also



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9. Find the equation of the hyperbola with centre at the origin, the length of transverse axis 6 and one focus at (0, 4)



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10. Find the coordinates of the point which divides the line segment joining the point, $(-2, 3, 5)$ and $(1, -4, 6)$ in the ratio.

2 : 3 internally,



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11. Find the coordinates of the point which divides the line segment joining the point, $(-2, 3, 5)$ and $(1, -4, 6)$ in the ratio.

2 : 3 externally,



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Section C

1. The salary of a person in the base year is ₹ 4,000 per annum and the current year salary is ₹ 6,000. If the CPI of the current year is 400, then rise his salary to maintain the same standard of living will be

A. ₹ 16,000

B. ₹ 12,000

C. ₹ 10,000

D. ₹ 8,000

Answer: A



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2. Median is always equal to

A. Q1

B. P75

C. D5

D. None of these

Answer:



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3. Find the consumer price index for 2007 on the basis of 2005 from the following data using weighted average

of price relative method:

Items	Food	Rent	Cloth	Fuel
Price in 2005 (₹)	200	100	150	50
Price in 2007 (₹)	280	200	120	100
Weight	30	20	20	10



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4. Find the Q1 for the following distribution. 11, 10, 24, 19, 13, 21, 20, 14, 25, 15, 32, 30, 36



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5. Compute D_3 for the following distribution : 3, 13, 11, 11, 5, 4, 2



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6. For a group of 50 male workers, the mean and standard deviations of their daily wages are ₹ 63 and ₹ 9 respectively for a group of 40 female workers, these are ₹ 54 and ₹ 6 respectively. Find the mean and standard deviation for the combined group.



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7. Following is the distribution of marks obtained by 50 students in a test.

Marks more than	0	10	20	30	40	50
No. of Students	50	46	40	20	10	3

If 60% of the students pass the test, find the minimum marks obtained by a pass student.



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8. Find cov (x, y) for the following data :

x 3 4 5 6 7

y 8 7 6 5 4



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9. Find the Karl Pearson's coefficient of correlation

between x and y for the following data:

x 16 18 21 20 22 26 27 15

y 22 25 24 26 25 30 33 14



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10. The table given below shows the daily attendance in thousands at a certain exhibition over a period of one week.

Week	Sun	Mon	Tue	Wed	Thur	Fri	sat
Attendance	52	48	64	68	52	70	72

Calculate three day moving average and illustrate these and original information of the same graph using the same scales.



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