



MATHS

BOOKS - OMEGA PUBLICATION

SAMPLE QUESTION PAPER -3

Section A 1 Mark

1. The set $A \cap A'$ is :

A. ϕ

B. U

C. A

D. A'

Answer:



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2. The maximum value of $(\cos \theta \sin \theta)$ is

A. 0

B. $1/2$

C. -1

D. $-\sqrt{2}$

Answer:



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3. Complex conjugate of i is :

A. i

B. $-i$

C. 0

D. 1

Answer:



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4. The value of ${}^{15}C_{11} \div {}^{15}C_{10}$ equals :

A. $15/11$

B. $15/10$

C. $5/11$

D. $5/10$

Answer:



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5. If a, b, c are in A.P. then :

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

B. $2b = a + c$

C. $2abc$

D. $4abc$

Answer:



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6. The locus of a point, whose abscissa and ordinate are always equal is :

A. $x + y = 0$

B. $x - y = 0$

C. $x + y = 1$

D. $x + y + 1 = 0$

Answer:



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7. The equation $x^2 + 3y^2 - 9x + 2y + 1 = 0$ represents

A. ellipse

B. parabola

C. hyperbola

D. circle

Answer:



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8. ਸੀਮਾਵਾਂ ਪਤਾ ਕਰੋ:- $\lim_{x \rightarrow 3} [x(x + 1)]$

A. 3

B. 12

C. 21

D. 0

Answer:



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9. In a single throw of two dice, the probability of getting total of 7 or 9 is :

A. $\frac{4}{18}$

B. $\frac{1}{3}$

C. $\frac{5}{18}$

D. None of these

Answer:



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Section B 2 Mark

1. Prove that
$$\frac{\sin(x + y)}{\sin(x - y)} = \frac{\tan x + \tan y}{\tan x - \tan y}$$



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2. Prove that $\sec \theta + \cos \theta$ can never be equal to $\frac{3}{2}$.



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3. Solve $\sqrt{2}x^2 + x + \sqrt{2} = 0$



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4. Find the value of

$$(\sqrt{3} + \sqrt{2})^6 + (\sqrt{3} - \sqrt{2})^6$$



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5. Evaluate ${}^{10}C_1 + {}^{10}C_2 + \dots + {}^{10}C_{10}$



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6. Show that the points : $(0,4,1)$, $(2,3,-1)$, $(4,5,0)$ and $(2,6,2)$ are vertices of square.



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7. Show by contradiction $p = \sqrt{2}$ is irrational.



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Section C 4 Mark

1. Out of 500 car owners investigated, 400 owned car A and 200 owned car B, 50 owned both A and B cars. Is the data correct ?



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2. Prove the following:

$$\cos 4x = 1 - 8 \sin^2 x \cos^2 x$$



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3. Prove the following:

$$\cos 4x = 1 - 8 \sin^2 x \cos^2 x$$



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4. If $2 \tan \alpha = 3 \tan \beta$, show that

$$\tan(\alpha - \beta) = \frac{\sin 2\beta}{5 - \cos 2\beta}$$



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5. Using principle of mathematical induction, prove that

$$\frac{1}{1.2} + \frac{1}{2.3} + \frac{1}{3.4} + \dots + \frac{1}{n(n+1)} = \frac{n}{n+1}$$



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6. Find n , if ${}^{2n}C_1$, ${}^{2n}C_2$ and ${}^{2n}C_3$ are in A.P.



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7. The sum of first three terms of a G.P. is $\frac{39}{10}$ and their product is 1 . Find the common ratio and the terms.



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8. If a^2, b^2, c^2 are in A.P. Prove that $\frac{a}{b+c}, \frac{b}{c+a}, \frac{c}{a+b}$ are also in A.P.



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9. Find the length of major and minor axes, the co-ordinates of foci, the vertices of the ellipse $3x^2 + 2y^2 = 18$.



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10. The foci of a hyperbola coincide with the foci of the ellipse $\frac{x^2}{25} + \frac{y^2}{9} = 1$, find the equation of hyperbola if eccentricity is 2.



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11. Find the derivative of $\frac{\sin x}{1 + \sin x}$ w.r.t., x



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12. A box contains 10 red marbles, 20 blue marbles and 30 green marbles. 5 marbles are drawn from the box, what is the probability that

all will be blue



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13. A box contains 10 red marbles, 20 blue marbles and 30 green marbles. 5 marbles are drawn from the box, what is the probability that at least one will be green



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Section D 6 Mark

1. Find the modulus of $\frac{1+i}{1-i} - \frac{1-i}{1+i}$.





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2. Express $\frac{1 + 2i}{1 - 3i}$ in polar form.



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3. Solve the inequalities given below and represent the solution graphically on number line:-

$$5(2x - 7) - 3(2x + 3) \leq 0, 2x + 19 \leq 6x + 47$$



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



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5. Use delta method to find the derivative of $\sin x + \cos x$.



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6. Find the mean deviation from the mean for following the data 4, 7, 8, 9, 10, 12, 13, 17.



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