MATHS

BOOKS - XII BOARD PREVIOUS YEAR PAPER

ENGLISH

XII Boards

Others

1. If a line makes angle $90o$, $60o$ and $30o$ with the positive direction of x, y and z-axis respectively, find its direction cosines.

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2. If A is a skew-symmetric matrix of order 3, then prove that det $A = 0$.

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3. Evaluate: $\int \frac{2x}{(x^2+1)(x^2+2)} dx$

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4. A die marked 1, 2, 3 in red and 4, 5, 6 in green is tossed. Let A be the event, the number is even, and B be the event, the number is red. Are A and B independent?

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5. Find the value of λ , if four points with position vectors

$3\hat{i}+6\hat{j}+9\hat{k}, \hat{i}+2\hat{j}+3\hat{k}, 2\hat{i}+3\hat{j}+\hat{k}$ and $4\hat{i}+6\hat{j}+\lambda\hat{k}$

are coplanar.

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6. If $e^y(x+1)=1$, show that $\frac{d^2y}{dx^2}=\left(\frac{dy}{dx}\right)^2$.

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7. Find the differential equation representing the family of curves $y = ae^{bx+5}$, where a and b are arbitrary constants.

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8. Prove that: $3\sin^{-1}x = \sin^{-1}\left(3x - 4x^3\right), x \in \left[-\frac{1}{2}, \frac{1}{2}\right]$

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9. Evaluate : $\int_0^{\frac{\pi}{4}} \frac{\sin x + \cos x}{16 + 9\sin 2x}$

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10. An open tank with a square base and vertical sides is to be constructed form a metal sheet so as to hold a given quantity of water. Show that the cost of material will be least when depth of tank is half its width. If the cost is to be borne by nearby settled lower income families, for whom water will be provided, what kind of value is hidden in the question

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11. Find the particular solution of the differential equation: $\left(1+e^{2}x\right)dy+\left(1+y^{2}\right)e^{x}dx=0$, given that $y(0)=1$

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12. Prove that the radius of the right circular cylinder of greatest curved surface area which can be inscribed in a given cone is half of that of the cone.

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13. Find the area, lying above the x-axis and included between the circle $x^2 + y^2 = 8x$ and the parabola $y^2 = 4x$.

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14. Find the area of the triangle formed by O, A, B when $\overrightarrow{OA} = \hat{i} + 2\hat{j} + 3\hat{k}, \overrightarrow{OB} = -3\hat{i} - 2\hat{j} + \hat{k}$.

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15. Find the principal value of: $\cos^{-1}\left(-\frac{1}{2}\right)$

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16. If x, y, z are different and $\Delta = \begin{vmatrix} x & x^2 & 1+x^3 \\ y & y^2 & 1+y^3 \\ z & z^2 & 1+z^3 \end{vmatrix} = 0$ then show that $1 + xyz = 0$

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