MATHS

BOOKS - SHARAM PUBLICATION

MODEL QUESTION PAPER -1

Exercise

1. If R be a relation from $\{11, 12, 13\}$ to $\{8, 10, 12\}$ defined by $y = x - 3$. What is R^{-1}?

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2. If $\sin\left(\sin^{-1}\frac{1}{5}+\cos^{-1}x\right)=1$, then find the value of x.

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3. If $\begin{vmatrix} 2x & x+3 \\ 2(x+1) & x+1 \end{vmatrix} = \begin{vmatrix} 1 & 5 \\ 3 & 3 \end{vmatrix}$ then find the value of x.

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4. What is the minimum value of $\begin{vmatrix} \sin x & \cos x \\ -\cos x & 1+\sin x \end{vmatrix}$?

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5. Find, $\frac{dy}{dx}$ when $y = x^x$.

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6. Find the interval in which the function $f(x) = 3x^4 - 4x^3 - 12x^2 + 5$ is strictly increasing.

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7. Write the value of $\int \frac{\sec^2 x}{\cos ec^2 x} dx$.

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8. Write the order and degree of the differential equation $\left(\frac{dy}{dx}\right)^4 + (3y)\frac{d^2y}{dx^2} = 0.$

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9. Find $\vec{a}.\left(\vec{b} \times \vec{c}\right)$ if $\vec{a} = 2\hat{i} + \hat{j} + 3\hat{k}$, $\vec{b} = -\hat{i} + 2\hat{j} + \hat{k}$ and $\vec{c} = 3\hat{i} + \hat{j} + 2\hat{k}.$

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10. If the equation of the line AB is $\frac{3-x}{1} = \frac{y+2}{-2} = \frac{z-5}{4}$ then write the d.r.s of the line parallel to AB.

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11. If $f(x) = \cos(\log_e x)$ then show that $f(x).\, f(y) - \frac{1}{2}\left[f(xy) + f\left(\frac{x}{y}\right)\right] = 0$

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12. Let R={(a, a^3): a is a prime number less than 5) be a relation. Find the range of R.

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13. Determine whether the following operation on the set R is associative and commutative $a * b = \frac{a+b}{2}$ for all $a, b \in R$.

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14. Solve $\cos\left(\tan^{-1} x\right) = \sin\left(\cot^{-1}\left(\frac{3}{4}\right)\right)$

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15. Write the solution of the following LPP

Maximise $Z = x + y$

Subject to $3x + 4y \leq 12, x \geq 0, y \geq 0$

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16. If $A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}$ then prove that $A^2 - 5A + 7I = O$

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17. If $A = \begin{bmatrix} -1 & 3 & 5 \\ 1 & -3 & -5 \\ -1 & 3 & 5 \end{bmatrix}$, then find $A^3 - A^2$.

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18. Solve for x,

$$\begin{vmatrix} 15-2x & 11 & 10 \\ 11-3x & 17 & 16 \\ 7-x & 14 & 13 \end{vmatrix} = 0$$

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19. Find the inverse of the matrix $\begin{bmatrix} 2 & 5 \\ 1 & 3 \end{bmatrix}$

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20. Find the value of $\begin{bmatrix} 1 & a & b+a \\ 1 & b & c+a \\ 1 & c & a+b \end{bmatrix}$.

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21. Find $\frac{dy}{dx}$, when $y^x = x^{\sin y}$

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22. Show that $f(x) = |x|$ is continuous at $x = 0$ but not deferentiable at $x = 0$.

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23. If $\sin y = \frac{2t}{1+t^2}$, $\cos x = \frac{1}{\sqrt{1+t^2}}$ then show that $\frac{dy}{dx}$ is independent of t.

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24. Find the interval where the function $f(x) = \sin x + \cos x, x \in [0, 2\pi]$ is increasing.

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25. Show that no two normals to a parabola are parallel.

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26. $\int \frac{\cos 2x - \cos 2\alpha}{\cos x - \cos \alpha} dx$

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27. Integrate: $\int_0^{\frac{3}{2}} [x^2] dx$

Watch Video Solution

28. Solve : $(x+y)dy + (x-y)dx = 0.$

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29. Solve: $\left(x^2 - 1\right)\frac{dy}{dx} + 2xy = 1$

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30. If the sum of two unit vectors is a unit vectors find the magnitude of their difference.

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31. If $\vec{a}, \vec{b}$ and $\vec{c}$ are mutually perpendicular, show that $\left[\vec{a}.\left(\vec{b} \times \vec{c}\right)\right]^2 = a^2b^2c^2$.

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32. Find the direction cosines of the line $\frac{x+2}{2} = \frac{2y-7}{6} = \frac{5-z}{6}$ Also find the vector

equation of the line passing through the point $(-1, 2, 3)$ and parallel to the given line.

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33. Find the equation of a plane biscting the line segment joining $(-1, 4, 3)$ and $(5, -2, -1)$ at right angle.

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34. Find the value of r, if the line $\frac{x-1}{1} = \frac{y+2}{3} = \frac{z-1}{-1} = r$ rintersects the plane $2x + y + z = 9$.

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35. If $(\cos x)^y = (\cos y)^x$, then find $\frac{dy}{dx}$.

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36. Evaluate $\int_0^{\pi} \frac{x}{a^2 \cos^2 x + b^2 \sin^2 x} dx$

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37. Find the area bounded by the curve $y = \sin x$ from $x = 0$ to $x = \pi$.

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38. Show that the inverse of a bijective function is unique.

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39. Prove that $\sin^{-1}\left(\frac{4}{5}\right)+\sin^{-1}\left(\frac{5}{13}\right)+\sin^{-1}\left(\frac{16}{65}\right)=\frac{\pi}{2}$

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40. If $\vec{a}, \vec{b}, \vec{c}$ are mutually perpendicular vectors of equal magnitude, show that $\vec{a} + \vec{b} + \vec{c}$ is equally inclined to $\vec{a}. \vec{b}. \vec{c}.$

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41. Find the coordinates of the foot of the perpendicular drawn from the point $(1, 1, 1)$ on the line joining $(1, 6, 4)$ and $(5, 4, 4)$.

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42. If $f(x) = \left(1 - x^3\right)^{\frac{1}{3}}$ then find $fof(x)$.

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43. Write the principal value of $\tan^{-1}(\sqrt{3}) - \cot^{-1}(-\sqrt{3})$.

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44. Find the value of $\begin{vmatrix} x^2 - x + 1 & x - 1 \\ x + 1 & x + 1 \end{vmatrix}$

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45. If $\begin{bmatrix} 3 & 5 & 3 \\ 2 & 4 & 2 \\ \lambda & 7 & 8 \end{bmatrix}$ is a singular matrix, write the value of lambda.

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46. What is the first derivative of $\cos^{-1}\left(\sin\left(\frac{\sqrt{1+x}}{2}\right)\right) + x^x$ w.r.t x at x=1.

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47. Find the intervals in which the function $y = \frac{\ln x}{x}$ is increasing and decreasing.

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48. Write the value of $\int_{-\pi/4}^{\pi/4} \sin^5 x \cos x dx$

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49. What is the solution of the equation $\frac{d^2y}{dx^2} = e^{-(2x)}$?

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50. What is the equation of the line passing through the point (1,2,3)and parallel to the vector $3\hat{i} + 2\hat{j} - 2\hat{k}$

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51. If $f: R \to R$ is the function defined by $f(x) = 4x^3 + 7$, then show that f is a bijection.

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52. If R and S are two equivalence relation on the set then prove that $R \cap S$ is also an equivlaence relation

on the set.

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53. If $*$ is a binary operation on set Q of rational numbers such tht $a * b = (2a - b)^2, a, b \in Q$. Find $3 * 5$ and $5 * 3$. Is $3 * 5 = 5 * 3$?

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54. Solve the following equation:

$$\cos\left(\tan^{-1} x\right) = \sin\left(\cot^{-1}\frac{3}{4}\right).$$

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55. $\begin{bmatrix} 1 & -2 \\ 3 & 2 \end{bmatrix}\begin{bmatrix} x & 2 \\ 1 & y \end{bmatrix} = \begin{bmatrix} -3 & 4 \\ -1 & 4 \end{bmatrix}$ Find x and y.

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56. Factorize the following. $\begin{bmatrix} x+a & b & c \\ b & x+c & a \\ c & a & x+b \end{bmatrix}$

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57. Solve the following : $\begin{bmatrix} 1+x & 1 & 1 \\ 1 & 1+x & 1 \\ 1 & 1 & 1+x \end{bmatrix}$ =0

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58. Eliminate x,y,z from

a=x/y-z, b=y/z-x, c=z/x-y

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59. For what value of λ,is the function $f(x) = \begin{cases} \lambda x^2 - 2x & \text{if } x \leq 0 \\ 4x + 1 & \text{if } x > 0 \end{cases}$ is continuous at x=0

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60. If cos y = x cos(a+y) then prove that

$$\frac{dy}{dx} = \frac{\cos^2(a+y)}{\sin a}$$

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61. If $y^2 \cot x = x^2 \text{coty}$ then find $\frac{dy}{dx}$

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62. Find the equation of the normal to the curve $y = (\log x)^2$ at $x = \frac{1}{e}$.

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63. Find two positive numbers whose product is 256 and whose sum is least.

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64. Integrate: $\int \frac{a}{b+ce^x}dx$

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65. Integrate: $\int \frac{\sec\left(\sqrt{x}\right)}{\sqrt{x}}dx$

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66. Prove that $\int_0^{\frac{\pi}{2}} \frac{\sin^n x}{\sin^n x+\cos^n x}dx = \frac{\pi}{4}$

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67. Find the area bounded by

$$y = \sin x, y = 0, x = \frac{\pi}{2}$$

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68. Solve : $(x + y)dy + (x - y)dx = 0.$

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69. If $\hat{i} + \hat{j} + \hat{k}$ and $2\hat{i} - \alpha\hat{j} + 3\hat{k}$ are orthogonal to each other then find α

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70. If the magnitude of the difference of two unit vectors is $\sqrt{3}$ then find the magnitude of their sum.

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71. Find the equation of the plane Paralel to the plane $2x - y + 3z + 1 = 0$ and at a distance 3 units away from it.

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72. If $\vec{a} = 2\vec{b}$ and $\vec{c} = -3\vec{b}$, then what is the angle between $\vec{a}$ and $\vec{c}$?

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73. If l_1, m_1, n_1 and l_2, m_2, n_2 are the direction cosines of two mutually perpendicular lines show that the d.cs. Of the line perpendicular to both of them are $m_1n_2 - n_1m_2, n_1l_2 - l_1n_2, l_1m_2 - m_1l_2$

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74. Find the value of k for which $f(x) = \begin{cases} \frac{\sqrt{1+kx} - \sqrt{1-kx}}{x}, & \text{if } -1 \leq x < 0 \\ \frac{2x+1}{x-1}, & \text{if } 0 \leq x < 1 \end{cases}$ is continuous at x = 0

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75. Find the derivative of $\left(\frac{x-1}{x^2+5}\right)^{-4} \cos^{-1}\left(\frac{1-x^2}{1+x^2}\right)$

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76. Use the function f(x) = $x^{\frac{1}{x}}, x > 0$ to show that e^pi)grt pi^e.

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77. Find the area enclosed by $y = 4x - 1$ and $y^2 = 2x$.

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78. If $\begin{bmatrix} x & x^2 & x^3-1 \\ y & y^2 & y^3-1 \\ z & z^2 & z^3-1 \end{bmatrix} = 0$

then prove that xyz=1 when x,y,z are non zero and unequal.

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79. Show that the inverse of a bijective function is unique.

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80. Prove the following

$$\tan^{-1}\frac{2a-b}{b\sqrt{3}}+\tan^{-1}\frac{2b-a}{a\sqrt{3}}=\frac{\pi}{3}$$

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81. Solve the following LPP graphically Maximize

$z = 20x + 10y$

Subject to $x + 2y \leq 40$

$3x + y \geq 30$

$4x + 3y \geq 60$

$x, y \geq 0$

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82. If $f: R \to R$and $g: R \to R$ are given by $f(x) = 8x^3$ and $g(x) = x^{\frac{1}{3}}$, then write fog.

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83. Write the principal value of $\cos^{-1}\left(\frac{\sqrt{3}}{2}\right) + \cos^{-1}\left(-\frac{1}{2}\right)$.

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84. If $\begin{bmatrix} 2x & 4 \end{bmatrix}\begin{bmatrix} x \\ -8 \end{bmatrix} = 0$then find the positive value of x.

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85. Find $\frac{d}{dx}$ In $\sin^{-1}\cos\left(\frac{\pi - 2e^x}{2}\right)$.

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86. Find the open interval in which $f(x) = x^{\frac{1}{x}}, x > 0$ is decreasing.

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87. What is the value of $\int \frac{1 + \frac{1}{x^2}}{x - \frac{1}{x} + 4} dx$

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88. Write the particular solution of $\frac{dy}{dx} = 8x$, given that y=2, when x=1.

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89. If $\vec{a} = 3\hat{i} + 3\hat{j} + \hat{k}$ and $\vec{b} = -2\hat{i} + \hat{j} - 2\hat{k}$ then what is the unit vector parallel to $\vec{a} + \vec{b}$

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90. Find the value of k for which the line $\frac{x-2}{3} = \frac{1-y}{k} = \frac{z-1}{4}$ is parallel to the plane 2x

+ 6y + 3z - 4 = 0.

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91. If $f: R \to R$ is defined as $f(x) = 10x + 7$. Find the function $g: R \to R$, such that $gof = fog = I_R$.

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92. Show that the relation R on the set A of real numbers defined as R = {(a,b): a $\leq b$).is reflexive. and transitive but not symmetric.

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93. If S is a set of all rational numbers except 1 and $*$ be defined on S by $a * b = a + b - ab$ for all $a, b \in s$ then prove that $*$ is a binary operation.

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94. If S is a set of all rational numbers except 1 and $*$ be defined on S by $a * b = a + b - ab$ for all $a, b \in s$ then prove that $*$ is commutative as well as associative.

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95. Prove that

$\cot^{-1} 7 + \cot^{-1} 8 + \cot^{-1} 18 = \cot^{-1} 3$

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96. Solve the following LPP graphically

Maximize, $Z = 20x + 30y$

Subject to $3x + 5y \leq 15$

$x, y \geq 0.$

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97. Verify that $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ satisfies the equation $A^2 - (a+d)A + (ad-bc)I = 0$ where I is the 2x2 unit matrix.

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98. If the matrix A is such that $\begin{bmatrix} 1 & -1 \\ 2 & 3 \end{bmatrix} A = \begin{bmatrix} -4 & 1 \\ 7 & 7 \end{bmatrix}$, find A.

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99. Show that $(a+1)$ is a factor of

$$\begin{vmatrix} (a+1) & 2 & 3 \\ 1 & a+1 & 3 \\ 3 & -6 & a+1 \end{vmatrix}$$

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100. Solve : $\begin{vmatrix} x-a & 0 & 0 \\ a & x-b & 0 \\ a & b & x-c \end{vmatrix} = 0$

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101. For what value of k is the function defined by

$\begin{cases} k(x^2+2) & when x \leq 0 \\ 3x+1 & when x > 0 \end{cases}$ .Continuous at x = 0. Also

write whether the function is continuous at x = 1.

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102. If sin y = x sin (a + y) then show that $\frac{dy}{dx} = \frac{\sin^2(a+y)}{\sin a}$

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103. Find $\frac{dy}{dx}$ when $y = x^{\sin y}$

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104. Find the interval in which the function $f(x) = 3x^4 - 4x^3 - 12x^2 + 5$ is strictly increasing.

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105. Find two numbers whose sum is 24 and product is maximum.

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106. Integrate: $\int x \frac{e^x}{(1+x)^2} dx$

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107. Integrate : $\int \frac{\tan^{-1} x}{1+x^2} dx$

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108. Evaluate $\int_0^{\frac{\pi}{2}} \frac{\sqrt{\cos x}}{\sqrt{\sin x}+\sqrt{\cos x}} dx$

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109. Find the area bounded by the line y = 2x, x- axis and the ordinate x = 3.

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110. Solve $2y^3 \frac{dy}{dx} = ax$

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111. Find $\left[\vec{a}\ \vec{b}\ \vec{c}\right]$ when $\vec{a} = \hat{i} - 2\hat{j} + 3\hat{k},\ \vec{b} = 2\hat{i} + \hat{j} - \hat{k},\ \vec{c} = \hat{j} + \hat{k}$

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112. If the position vectors of the points A, B, C are $2\hat{i} + \hat{j} - \hat{k}, 3\hat{i} - 2\hat{j} + \hat{k}$ and $\hat{i} + 4\hat{j} - 3\hat{k}$ respectively, then prove that A, B, C are collinear.

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113. Write the volume of the parallelopiped whose sides are given by $-\hat{j}, \hat{k}, -\hat{i}$

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114. The angle between the plane $3x + 3z - 5 = 0$ and the line $\frac{x-1}{1} = \frac{y-2}{-1} = \frac{z-3}{0}$ is.

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115. Find the equation of the plane passing through the intersection of the planes 3x + y- z = 2 and x-y + 2z

=1and the point (1, 0,2)

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116. Prove that $\left(\vec{a}.\ \vec{b}\right)^2 = a^2b^2 - \left(\vec{a} \times \vec{b}\right)^2$

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117. Show that the lines $\frac{x-4}{1} = \frac{y+3}{-4} = \frac{z+1}{7}$ and $\frac{x-1}{2} = \frac{y+1}{-3} = \frac{z+10}{8}$ are coplaner. Find their point of intersection.

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118. If $x = \frac{1-\cos^2\theta}{\cos\theta}, y = \frac{1-\cos^{2n}\theta}{\cos^n\theta}$ then show that $\left(\frac{dy}{dx}\right)^2 = n^2\left(\frac{y^2+4}{x^2+4}\right)$

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119. Find the altitude of a right circular cylinder of maximum volume inscribed in a sphere of radius r.

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120. Evaluate the following integrals $\int \frac{12\sin x - 2\cos x + 3}{\sin x + \cos x} dx$

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121. Determine the area common to the parabola $y^2 = x$ and the circle $x^2 + y^2 = 2x$.

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122. Solve the following differential equations

$$\frac{dy}{dx} + 2y \tan x = \sin x, y\left(\frac{\pi}{3}\right) = 0$$

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123. If $A = \begin{bmatrix} 1 & 1 \\ -1 & -1 \end{bmatrix}, B = \begin{bmatrix} -1 & 3 \\ -3 & 1 \end{bmatrix}$ then show that $(A + B)^2 \neq A^2 + 2AB + B^2$.

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124. If $f: R \to R$ defined by $f(x) = 5x - 8$ for all $x \in R$, then show that f is invertible. Find the corresponding inverse function.

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125. Prove statement $\sin^{-1}\frac{3}{5} + \cos^{-1}\frac{12}{13} = \cos^{-1}\frac{33}{65}$

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126. Solve the following LPP graphically: Maximize: $Z = 4x_1 + 3x_2$ subject to $x_1 + x_2 \leq 50$, $x_1 + 2x_2 \leq 80$,$2x_1 + x_2 \geq 20$, $x_1, x_2 \geq 0$

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127. The total number one-one function from a finite set with m elements to a set with n elements form>n is

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128. If $\tan^{-1}(\sqrt{3}) + \cot^{-1}x = \frac{\pi}{2}$, then find x.

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129. What is the value of $\begin{vmatrix} 0 & 8 & 0 \\ 25 & 520 & 25 \\ 1 & 410 & 0 \end{vmatrix}$?

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130. Write the matrix which when added to the matrix $\begin{bmatrix} 2 & -3 \\ -4 & 7 \end{bmatrix}$ give the matrix $\begin{bmatrix} 4 & 1 \\ 3 & 2 \end{bmatrix}$

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131. Find $\frac{dy}{dx}$ when $y = \cot^{-1}\tan\left(\frac{\pi}{2} - x\right)$

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132. If the radius of a sphere is doubled, then its volume is increase by _____.

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133. $\int_0^{\frac{\pi}{2}} In(\tan x + \cot x)dx$

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134. Write the order of the differential equation of the system of ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1.$

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135. If vectors $\vec{a}$ and $\vec{b}$ are such that $\vec{a} = 3, \left|\vec{b}\right| = \frac{2}{3}$ and $\vec{a} \times \vec{b}$ is a unit vector, then find the angle between $\vec{a}$ and $\vec{b}$.

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136. Find the direction cosines of the line $\frac{4-x}{2} = \frac{y}{2} = \frac{1-z}{3}$

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137. For what valueof K is the following function continuous at x = 2 ? $f(x) = \begin{cases} 2x+1 & when x < 2 \\ k & when x = 2 \\ 3x-1 & when > 2 \end{cases}$

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138. If $x = a\cos t, y = t\sin t$ then find $\frac{dy}{dx}$

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139. Differentiate the function $x^{\cos x}$ w.r.t.x

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140. Find the slope of the tangent to the curve $y = \sin 3t, x = 2t$ at $t = \frac{\pi}{4}$

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141. If f(x) = a In $x + bx^2 + x$ has extreme values at $x = -1$ and $x = 2$ then find a and b.

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142. Write the value of x-y+z from the relation $\begin{bmatrix} x+y+z \\ x+z \\ y+z \end{bmatrix} = \begin{bmatrix} 4 \\ 8 \\ 5 \end{bmatrix}$.

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143. Find the transpose of the matrix $\begin{bmatrix} 3 & -2 & -4 \\ 3 & -2 & -5 \\ -1 & 1 & 2 \end{bmatrix}$.

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144. Prove the following:

$$\begin{bmatrix} b^2 - ab & b - c & bc - ac \\ ab - a^2 & a - b & b^2 - ab \\ bc - ac & c - a & ab - a^2 \end{bmatrix} = 0$$

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145. Using the properties of determinants prove that

$$\begin{vmatrix} a+b+2c & a & b \\ c & b+c+2a & b \\ c & a & c+a+2b \end{vmatrix} = 2(a+b+c)^3$$

or

$$\begin{vmatrix} x+y+2z & x & y \\ z & y+z+2x & y \\ z & x & z+x+2y \end{vmatrix} = 2(x+y+z)^3$$

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146. Evaluate $\int \left(x + \sqrt{x^2 + a^2}\right) dx$

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147. Evaluate $\int \cos ec^2 x \sqrt{\cot x} dx$

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148. Prove that $\int_0^{\frac{\pi}{2}} \ln \sin x dx = -\frac{\pi}{2} \ln 2$

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149. Determine the area of the region between the curves $y = \cos x$ and $y = \sin x$, bounded by $x = 0$.

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150. Find the general solution of the differential equation $\left(1 + x^2\right) \tan^{-1} y dy = \left(1 + y^2\right) \tan^{-1} x dx$.

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151. Prove that $f: R \to R$ such that $f(x) = \frac{2x^2}{x^2+1}$ is neither one-one nor onto function.

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152. Let A={1, 2, 3, 5}, B={4, 6, 9}, A relation R form A to B is defined by $R = \{(x, y): x \in A, y \in B$and $x - y$ is odd}.write R in roster form.

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153. Consider the binary operation $*$ on the set {1, 2, 3, 4 5} defined by a $*$ b = min (a, b). Write operation table of operation $*$.

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154. Prove statement $\tan\left(2\tan^{-1}\frac{1}{5}-\frac{\pi}{4}\right)+\frac{7}{17}=0$

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155. Find the maixmum value of $z=50x_1+60x_2$ subject to $2x_1+3x_2\leq 6, x_1, x_2\geq 0$

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156. Write the values of a and b, for which the vectors $(a-1)\hat{i}+(b+2)\hat{j}+4\hat{k}$ and $(a+1)\hat{i}+(b-2)\hat{j}+8\hat{k}$ will be parallel.

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157. Find the scalar projection of the vector $\vec{a}=3\hat{i}+6\hat{j}+9\hat{k}$ on $\vec{b}=2\hat{i}+2\hat{j}-\hat{k}$.

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158. Find the co-ordinates of the point where the perpendicular from the origin meets the line joining the points $(-9, 4, 5)$ and $(11, 0, -1)$.

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159. Find the equation of the plane passing through the line x = y = z and the point (3,2,1).

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160. Find the co-ordinates of the point where the line $\frac{x-2}{3} = \frac{y+1}{4} = \frac{z-2}{2}$ intersect the plane x-y+z-

5=0

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161. Find $\frac{dy}{dx}$ when $x^y + y^x = a^b$

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162. Evaluate $\int e^x \left(\frac{1 + \sin x}{1 + \cos x} \right) dx.$

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163. $\int \sin^{-1} \sqrt{\frac{x}{a + x}} dx =$ _____.

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164. Find the area of the region in the first quadrant bounded by x - axis, the line y = x and the circle $x^2 + y^2 = 18$.

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165. Show that the relation S defined on set $N \times N$ by $(a, b)S(c, d) \Rightarrow a + d = b + c$ is an equivalence relation.

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166. Solve: $\tan^{-1}\frac{x-2}{x-2}+\tan^{-1}\frac{x+1}{x+2}=\frac{\pi}{4}$

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167. Find graphically the maximum value of $z=2x+5y$ subject to the constraints $2x+4Y\leq 8, 3x+y\leq 6, x\geq 0, y\geq 0.$

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168. If $\vec{a}, \vec{b}$ and $\vec{c}$ are three vectors such that $\left|\vec{a}\right|=3, \left|\vec{b}\right|=4$ and $\left|\vec{c}\right|=5$ and each one of these

is perpendicular to the sum of other two, then find $\left|\vec{a}+\vec{b}+\vec{c}\right|$.

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169. Find the coordinates of foot of perpendicular drawn from the point (0, 2, 3) on the line $\frac{x+3}{5}=\frac{y-1}{2}=\frac{z+4}{3}$. Also, find the length of perpendicular.

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