

MATHS

BOOKS - OSWAAL PUBLICATION MATHS (KANNADA ENGLISH)

SOLVED PAPER MARCH - 2018



1. Bijective function

2. Which of the following of the principal value branch of $\cos^{-1} x$?

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3. Construct a
$$2 imes 2$$
 matrix, $A=ig[a_{ij}ig]$, whose elements are given by $a_{ij}=rac{i}{j}$

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4. If A is an invertible matrix of order 2, then det (A^{-1}) is equal to(a) det (A) (B) $\frac{1}{\det(A)}$ (C) 1 (D) 0

5. If
$$y=e^{3x}, \ \ ext{find} \ \ rac{dy}{dx}$$

6. Evaluate:
$$\int \frac{x^3 - 1}{x^2} dx$$

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7. Find the unit vector in the direction of the vector

$$\overrightarrow{a} = \hat{i} + \hat{j} + 2\hat{k}.$$

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



9. Define optimal solution in linear programming problem.



10. If
$$P(A)\frac{7}{13}$$
, $P(B) = \frac{9}{13}$ and $P(A \cap B) = \frac{4}{13}$,
find $P\left(\frac{A}{B}\right)$.
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1. The identity element for the binary operation * defined on Q - {0} as $a * b = rac{ab}{2}, \ orall a, b \in Q - \{0\}$ is

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

value of x.

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3. Write the following in the simplest form of
$$\tan^{-1}\left(\frac{\cos x - \sin x}{\cos x + \sin x}\right), 0 < x < \frac{\pi}{2}$$

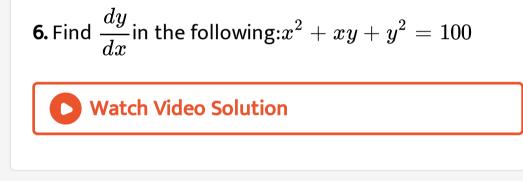
4. Find the area of the triangle whose vertices are:

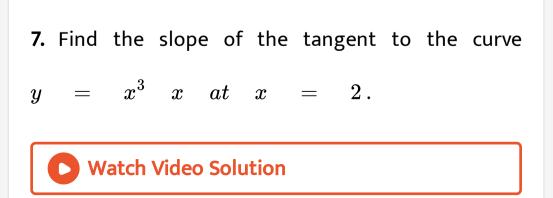
$$(-2, -3), (3, 2), (-1, -8)$$

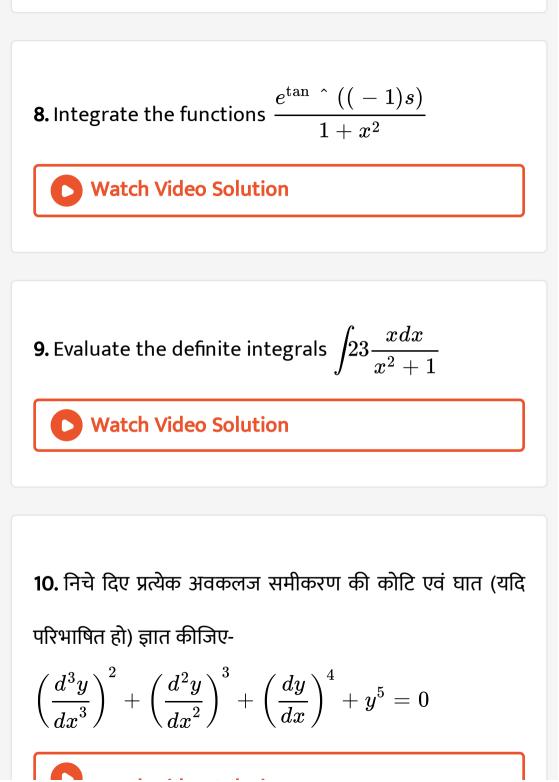


5. Differentiate $x^{\sin x}$ with respect to x.











11. find the projection of the vector $\hat{i}+3\hat{j}=7\hat{k}$ on

the vector $7\hat{i}-\hat{j}+8\hat{k}$

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12. Find the area of the parallelogram whsoe adjacent

sides are given by the vectors $\overrightarrow{a}=3\hat{i}+\hat{j}+4\hat{k} ext{ and } \overrightarrow{b}=\hat{i}-\hat{j}+\hat{k}$

13. Find the angle between the planes whose vector

equations are

$$\overrightarrow{r}.\left(2\hat{i}+2\hat{j}-3\hat{k}
ight)=5$$
 and vecr.(3hati-

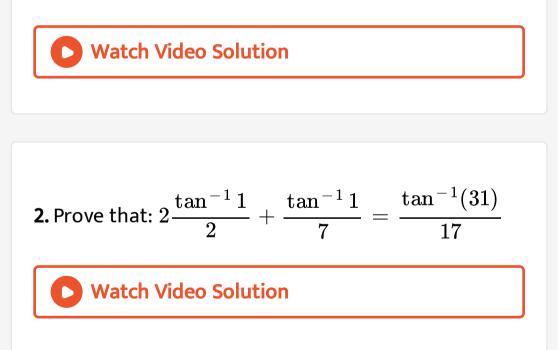
3hatj+5hatk)=3`.



14. Probability distribution of x is

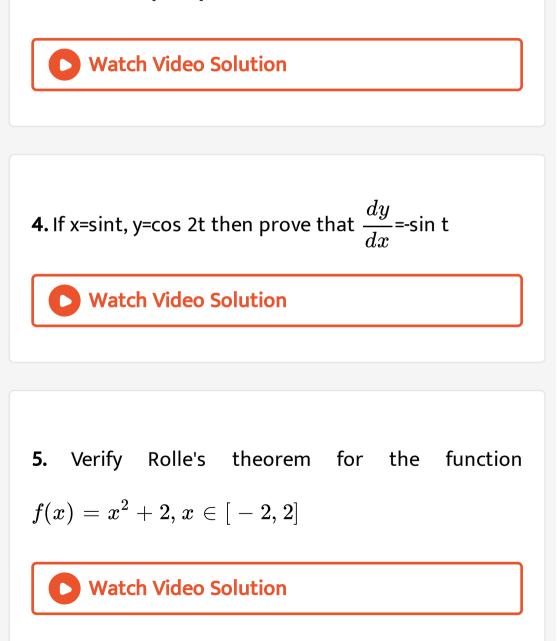
1. Show that the relation R in the set $A = \{1, 2, 3, 4, 5\}$ given by $R = \{(a, b) : |a - b|$ is even b is an equivalence relation

even }, is an equivalence relation.



3. Using elementary transformations, find the inverse

of the matrix[1327]



6. Find two numbers whose sum is 24 and whose

product is as large as possible.

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

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8. Find
$$\int e^x \sin x dx$$

9. Find the area of the region bounded by the curve

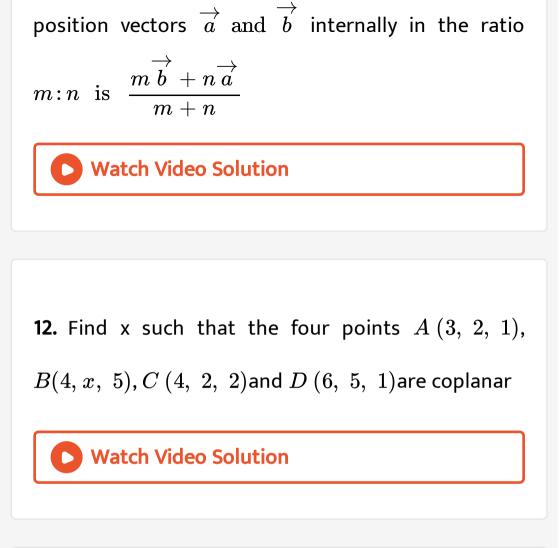
$$y = x^2$$
 and the line $y = 4$.



10. Form the differential equation representing the family of curves $y = as \in (x + b)$, where a, b are arbitrary constants.

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11. Show that the position vector of the point P, which divides the line joining the points A and B having



13. Find the equation of the plane through the intersection of the planes

3x - y + 2z - 4 = 0 and x + y + z - 2 = 0 and

the point (2,2,1).



14. A bag contains 4 red and 4 black balls, another bag contains 2 red and 6 black balls. One of the two bags is selected at random and a ball is drawn from the bag which is found to be red. Find the probability that the ball is drawn from the first





1. Let R+ be the set of all non-negative real numbers. Show that the function $f\colon R+ o [4,\infty]$ given by $f(x)=x^2+4$ is invertible and write the inverse of f.

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2. If A = [067 - 6087 - 80], B = [011102120], C = [2 - 23]Calculate AC, BC and (A + B)C. Also, verify that (A + B)C = AC + BC

3. Solve the following system of linear equations by matrix method.

x-y+2z=7

3x+4y-5z=-5

2x-y+3z=12



4. If
$$y = \left(\tan^{-1} x \right)^2$$
, show that

$$ig(x^2+1ig)^2 y_2 + 2xig(x^2+1ig)y_1 = 2ig)$$

5. Sand is pouring from a pipe at the rate of $12 \ cm^3 / s$. The falling sand forms a cone on the ground in such a way that the height of the cone is always one-sixth of the radius of the base. How fast is the height of the sand cone increasing when the height is 4 cm?

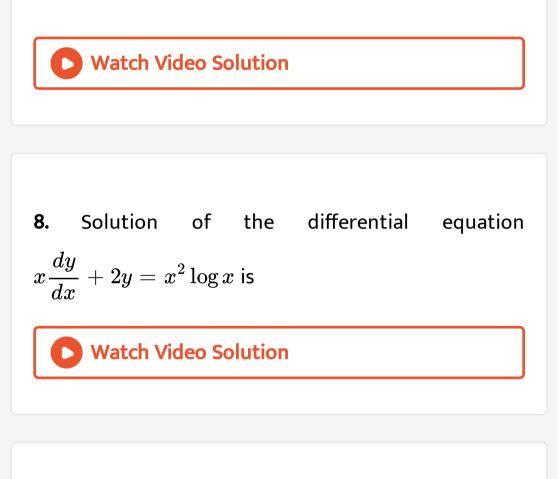
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6. Find the integral of
$$\frac{1}{x^2 + a^2}$$
 with respect to x and hence find $\int \frac{1}{x^2 - 6x + 13} dx$.

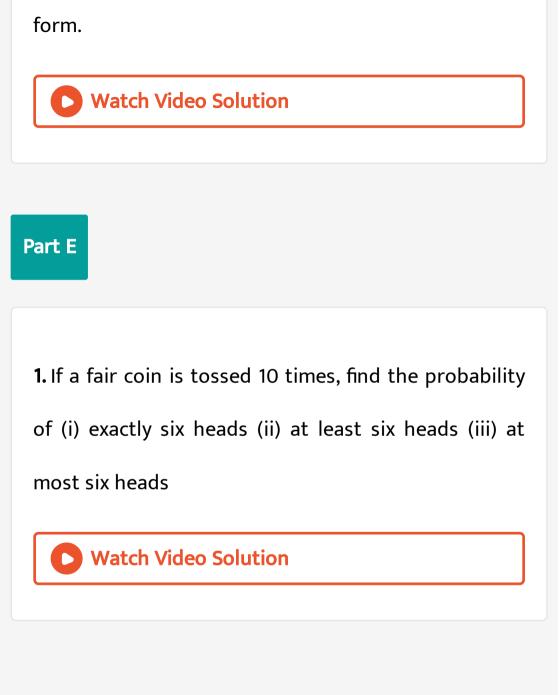
7. Using integration find the area of region bounded

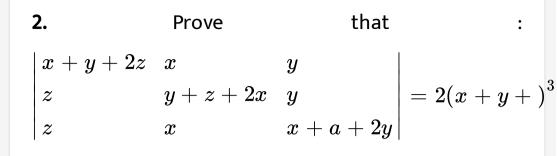
by the triangle whose vertices are (1, 0), (2, 2) and (3,

1).



9. Derive the equation of a line in space passing through two given plots both in vector and Cartesian





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3. Solve the following L.P.P graphically

Minimise and maximise z = 3x + 9y

Subject to the constraints $x+3y\leq 60$

 $x+y \geq 10$

 $x \leq y$

 $x \geq 0, y \geq 0$

