



MATHS

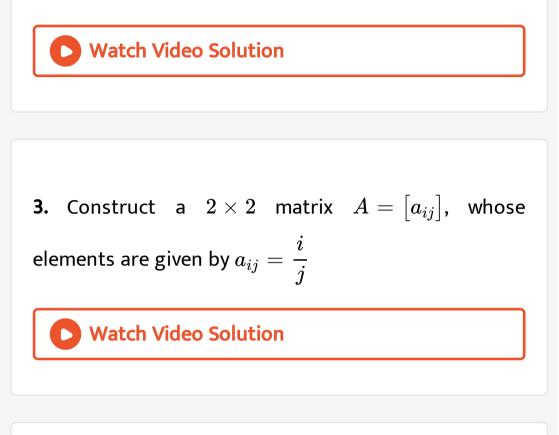
BOOKS - SUNSTAR MATHS (KANNADA ENGLISH)

II PUC MATHEMATICS ANNUAL EXAM QUESTION PAPER MARCH -2018



1. Define bijective function.

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



4. If A is an invertible matrix of order 2 then find $\left|A^{-1}\right|$

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



6. Find
$$\int \!\! \frac{x^3-1}{x^2} dx$$

Watch Video Solution

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° , 60° and 30° with the positive direction of x,y and z axis respectively, find its direction cosines.

9. Define optimal solution in linear programming problem .

Watch Video Solution
10. If
$$P(A) = \frac{7}{13}$$
, $P(B) = \frac{9}{13}$ and $P(A \cap B) = \frac{4}{13}$
find $P(A/B)$

Part B

1. Let * be a binary operation on Q defind by $a \cdot b = \frac{ab}{2}, \forall a, b \in Q$ Determine whether * is associative or not.

Watch Video Solution

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

value of x.

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

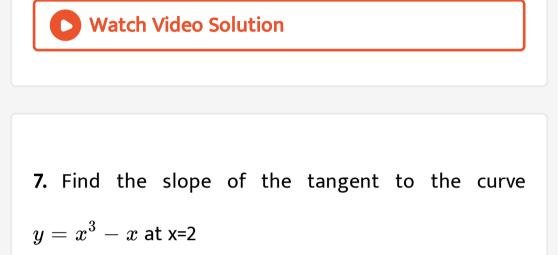
4. Find the area of the triangle whose vertices are

(-2,3), (3,2) and (-1,-8) by using determinant method.

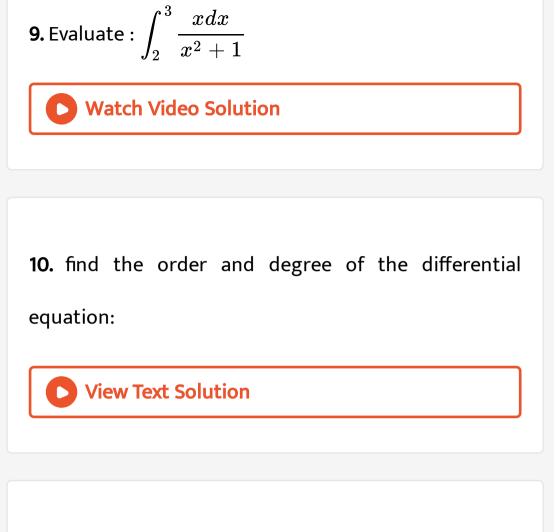


5. Differentiate $x^{\sin x}, x > 0$ with respect to x.

6. Find
$$\displaystyle rac{dy}{dx}$$
 if $x^2 + xy + y^2 = 100$



8. Integrate
$$rac{e^{ an^{-1}x}}{1+x^2}$$
 with respect to x.



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

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

12. Find the area of the parallelogram whose adjacent sides are determined by the vecor $\vec{a} = 3\hat{i} + \hat{j} + 4\hat{k}$

and
$$\overrightarrow{b}\,=\,\hat{i}\,-\,\hat{j}+\hat{k}$$

Watch Video Solution

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

Watch Video Solution

14. A random variable X has the following probability

distribution :

X	0	1	2	3	4
P(X)	0.1	k	2k	2k	k

find the value of k



15. A random variable X has the following probability

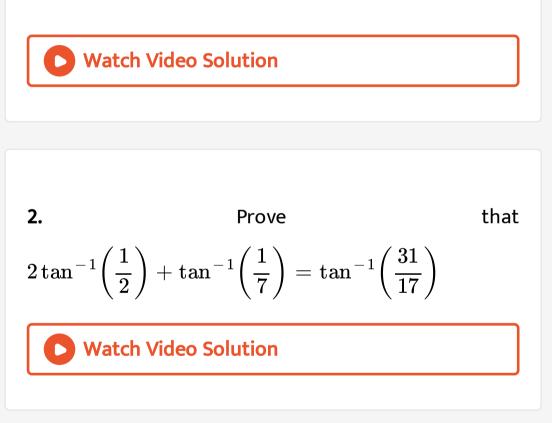
distribution :

 $P(X \ge 2)$

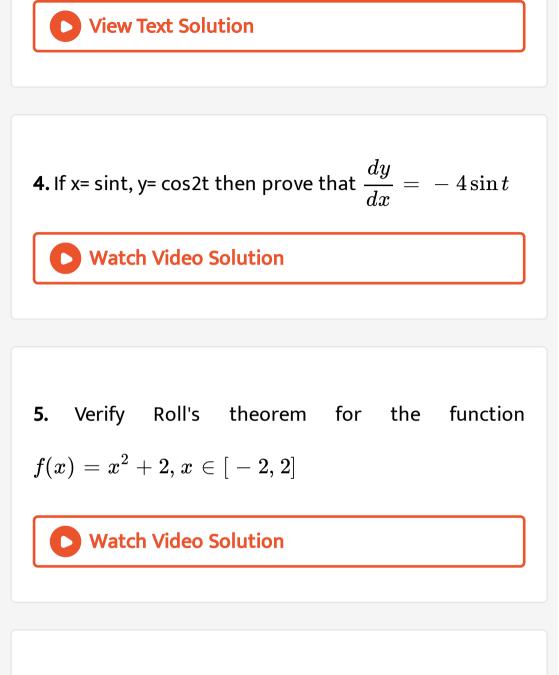




1. Show that the relation R in the set $A = \{1, 2, 3, 4, 5\}$ given by $R = \{(a, b) : |a - b|$ is even} is an equivalence relation.



3. By using elementary transformations , find the inverse of the matrix



6. Find two number whose sum 24 and whose product

is as large as possible.



7. Find
$$\int \!\!\! \frac{x dx}{(x+1)(x+2)}$$

Watch Video Solution

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

Watch Video Solution

9. Find the area of the region bounded by the curve $y=x^2$ and line y=4

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



11. Show that the position vector of the point P, which divides the line joining the points A and B having position vectors \overrightarrow{a} and \overrightarrow{b} internally in ratio m:n is $\frac{m\overrightarrow{b} + n\overrightarrow{a}}{m+n}$ 12. Find x such that the four points A(3,2,1), B(4,x,5),

C(4,2,-2) and D(6,5,-1) are coplanar



13. Find the equation of the plane through the intersection of the planes 3x - y + 2z - 4 = 0, 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 bag.

Watch Video Solution

Part D

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



Watch Video Solution

2. If

$$A = \begin{bmatrix} 0 & 6 & 7 \\ -6 & 0 & 8 \\ 7 & -8 & 0 \end{bmatrix}, B = \begin{bmatrix} 0 & 1 & 1 \\ 1 & 0 & 2 \\ 1 & 2 & 0 \end{bmatrix}, C = \begin{bmatrix} 2 \\ -2 \\ 3 \end{bmatrix}$$
calculate AC, BC and (A+B)C. Also verify that
(A+B)C=AC+BC

Watch Video Solution

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

x-y+2z=7

3x+4y-5z=-5

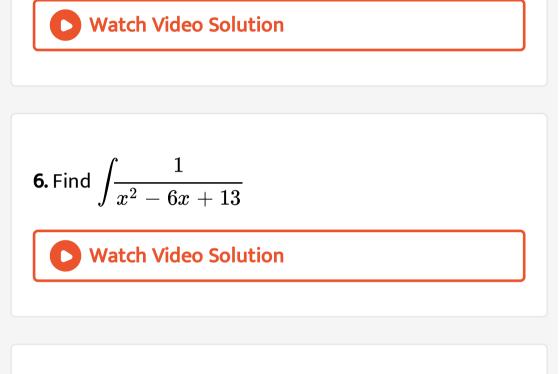
2x-y+3z=12

Watch Video Solution

4. If
$$y = \left(\tan^{-1}x\right)^2$$
 show that $\left(x^2+1\right)^2 y_2 + 2x\left(x^2+1\right)y_1 = 2$

5. Sand is pouring from a pipe at the rate of $12cm^3/s$. 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 4cm?



7. Using integration find the area of the region bounded by the triangle whose vertices are (1,0),(2,2) and (3,1).



8. Find the general solution of the differential equation $x \frac{dy}{dx} + 2y = x^2 \log x$

9. Derive the equation of a line space passing through

two given points both in vector and cartesian form.



10. If a fair coin is tossed 10 times, find the probability

of

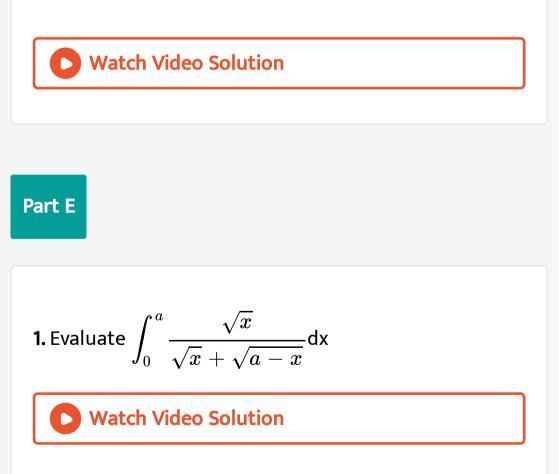
Exactly six heads

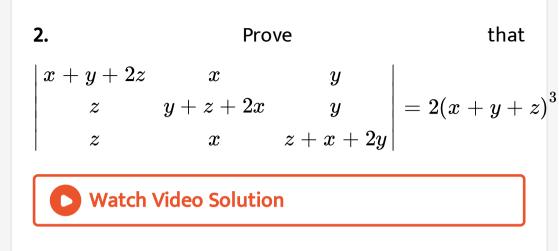


11. If a fair coin is tossed 10 times, find the probability

of

Atleast six heads.





3. Minimize and Maximize Z = 3x + 9y subject to the constraints $x+3y\leq 60$

x+y ≥ 10

 $x \leq y$

 $x\,\geq\,0, {
m y}\,\,\geq\,\,$ 0 by the graphical method .

4. Find the relationship between a and b so that the function f defind by $f(x) = egin{cases} ax+1 & ext{ if } x\leq 3 \ bx+3 & ext{ if } x>3 \end{cases}$ is

continuous at x=3