





MATHS

BOOKS - JEEVITH PUBLICATIONS MATHS (KANNADA ENGLISH)

SUPER MODEL QUESTIONS PAPER (WITH ANSWERS)



1. Define a transitive relation.

2. Write the set of the value of x for which

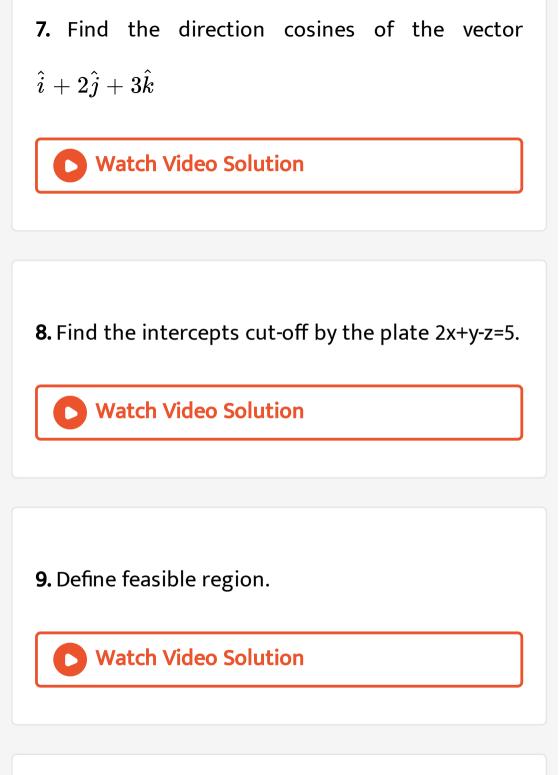
$$2 an^{-1}x = \cos^{-1}rac{1-x^2}{1+x^2}$$
 holds.



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3. Construct a 2 imes 3 whose elements are given by $a_{ij} = |i-j|.$

4. If
$$A = \begin{bmatrix} 1 & 2 \\ 4 & 2 \end{bmatrix}$$
, then show that $|2A| = 4|A|$
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5. $\cos(\sin x)$
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6. Find $\int \cos 3x dx$



10. Given that E and F are events such that P(E)=0.6, P(F)=0.3 and $P(E \cap F) = 0.2$, find P(E/F) and P(E/F).

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1. Show that the function $f\!:\!R o R$ defined by

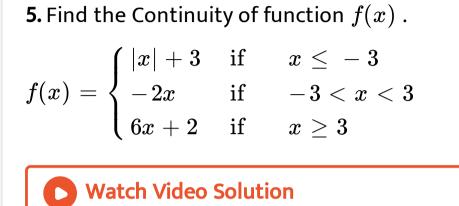
 $f(x) = x^2 \, orall \, x \in R$ is neither injective nor

subjective.

2. Evaluate
$$\sin^{-1}\left(\sin\left(\frac{2\pi}{3}\right)\right)$$

3. Simplify the following:
If
$$\sin\left\{\sin^{-1}\frac{1}{5} + \cos^{-1}x\right\} = 1$$
 find x
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4. Find area of the triangle with vertices (2,7),(1,1), (10,8).



6. Is the function defined by $x^2 - \sin x + 5$ continous at $x = \pi$?

7.
$$y = x^4 - 6x^3 + 13x^2 - 10x + 5$$
 at (0,5).

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8.
$$\int_{-1}^{1} (x+1) dx$$
.

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9.
$$\int_2^3 \frac{1}{x} \, \mathrm{d}x$$

10.
$$y = \sqrt{1 + x^2}$$
 and $y' = \frac{xy}{1 + x^2}$
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11. If the position vectors of the points A and B respectively are i+2j-3k and j-k find the direction cosines of AB

12. Find unit vector in the direction of vector $\hat{i}+\hat{j}+2\hat{k}$

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13. Find the distance of the point (2,3,-5) from the

plane r.(i + 2j - 2k) = 9.



14. A die is thrown. If E is the event 'the number appearing is a multiple of 3' and F is the event 'the number appearing is even', then find whether E and F are independent?



Part C

1. Show that the relation R in the set $A = \{x \in z, 0 \le x \le 12\}$ given by $R = \{(a, b) : |a - b| \text{ is a multiple of 4} \}$ is an equivalence relation.

2. Show that
$$\sin^{-1}\frac{3}{5} - \sin^{-1}\frac{8}{17} = \cos^{-1}\frac{84}{85}$$

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3. Find the value of a,b,c and d from the equation:

$$egin{bmatrix} a-b & 2a+c \ 2a-b & 3c+d \end{bmatrix} = egin{bmatrix} -1 & 5 \ 0 & 13 \end{bmatrix}$$

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$$\textbf{4.} \, y = \sin^{-1} \bigg(\frac{1-x^2}{1+x^2} \bigg), 0 < x < 1.$$



6. Find the point on the curve $y = x^2 - 11x + 5$

at which the tangent is y=x-11.

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 7.
$$\int \frac{dx}{\sqrt{1+4x^2}}$$
.

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8.
$$\int \frac{3x}{1+2x^4} \, \mathrm{d} \mathsf{x}$$

9. Find the area of the region bounded by the ellipse $\frac{x^2}{16} + \frac{y^2}{9} = 1$. Watch Video Solution

10. Form the differential equation of the family of

circles touching the y- axis at origin.

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11. Find the area of the triangle with vertices A(1,1,2), B(2,3,5) and C(1,5,5).

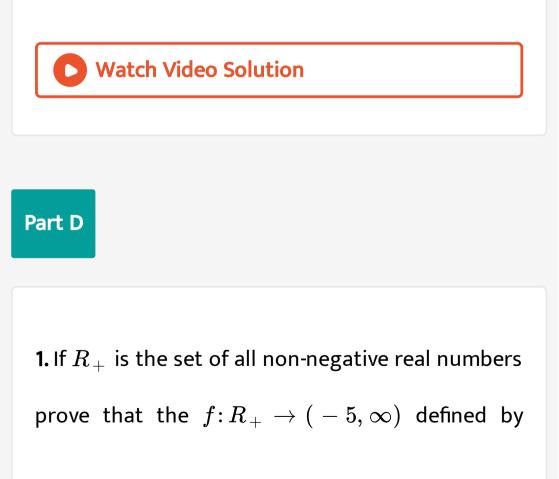
12. Find the area of the parallelogram whose adjacent sides are determined by the vectors $a = \hat{i} - \hat{j} + 3\hat{k}$ and $b = 2\hat{i} - 7\hat{j} + \hat{k}$.

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13. Find the vector and the Cartesian equation of the line that passes through the points (3,-2,-5), (3,-2,6).

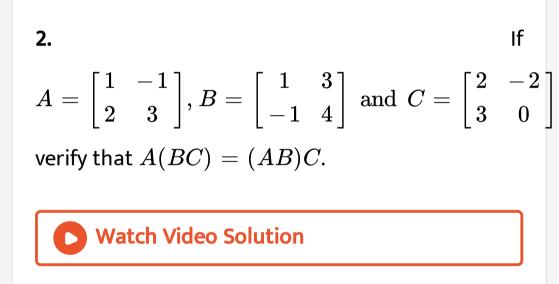


14. Consider the experiment of tossing two fair coins simultaneously, find the probability that both are head given that at least one of them is a head.



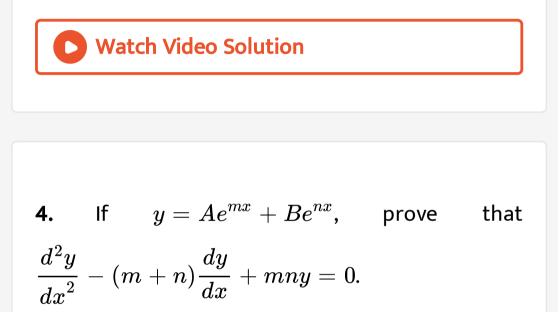
 $f(x) = 9x^2 + 6x - 5$ is invertible. 39. Write also, $f^{-1}(x).$

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3. The cost of 4kg onion, 3 kg wheat and 2kg rise in Rs. 60. The cost of 2kg onion, 4 kg wheat and 6

kg rice in Rs.90. The cost of 6kg onion, 2kg wheat and 3 kg rice is Rs.70. Find cost of each item per kg by matrix method.



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5. The length x of rectangle is decreasing at the rate of 5cm/minute and width y is increasing at

the rate of 4 cm/minute. When x=8 cm and y=6 cm,

find the rate of change of (i) the perimeter and (ii)

the Area of the rectangle.



6. Find the integral of $\sqrt{x^2 + a^2}$ w.r.t. x and hence evaluate $\int \sqrt{x^2 + 4x + 6}$, dx.

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7. Find the area of the region bounded by the parabola $y = x^2$ and y = |x|.



8. Solve
$$rac{dy}{dx}+3y=e^{-2x}.$$



9. Derive the equation of a plane in normal form

both in the vector and Cartesian form .



10. From a lot of 30 bulbs which include 6 detective, a sample of 4 balls is drawn at random with replacement. Find the probability distribution of the number of defective bulbs.

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Part E

1. (a) Prove that
$$\int_0^{2x} f(x) dx = 2 \int_0^{2x} f(x) dx$$
 when $f(2a-x) = f(x)$ and hence evaluate

$$\int_{0}^{\pi} |\cos x| dx.$$
(b) Prove that $\begin{vmatrix} -a^{2} & ab & ac \\ bc & -b^{2} & bc \\ ca & cb & -c^{2} \end{vmatrix} = 4a^{2}b^{2}c^{2}.$
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