



MATHS

BOOKS - JEEVITH PUBLICATIONS MATHS (KANNADA ENGLISH)

MODEL QUESTION PAPER 5



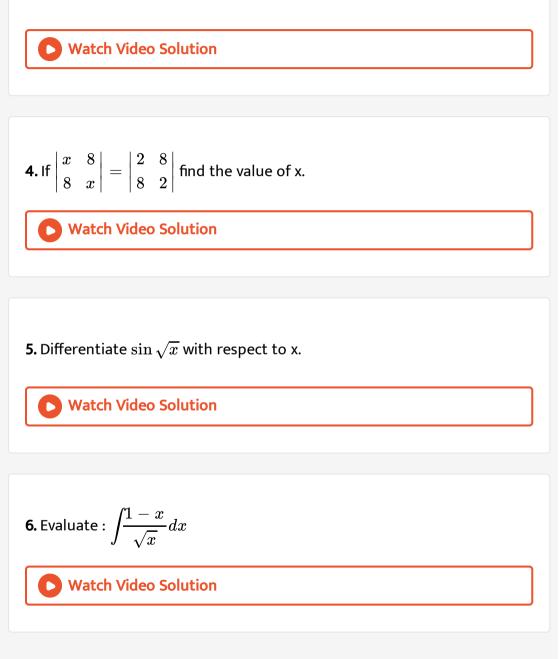
1. Give an example of a relation which is reflexive and symmetric but not

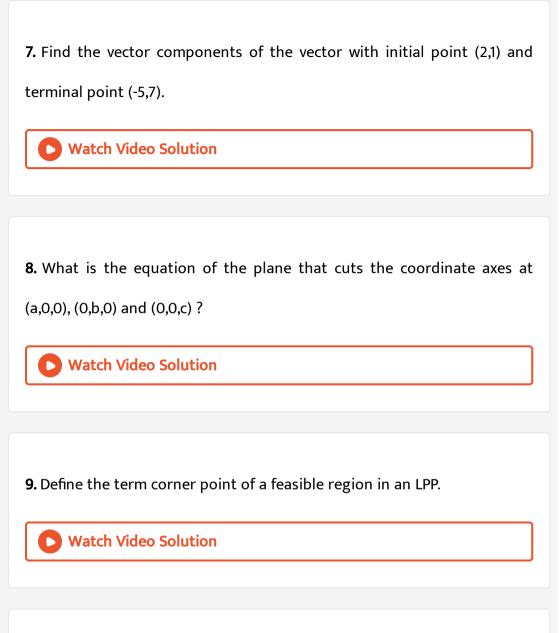
transitive.

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2.
$$\cot(\tan^{-1}a + \cot^{-1}a)$$

3. Define a scalar matrix.





10. If E is an event of a sample space S of a experiment then find P(S/F)

1. Verify whether the operation * defined on Q by a*b = $rac{ab}{4}$ is associated

or not.

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2. Simplify the following:

$$\tan^{-1}\sqrt{3} - \sec^{-1}(-2)$$

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3. Write
$$an^{-1} igg(\frac{\sqrt{1-\cos x}}{\sqrt{1+\cos x}} igg), \ 0 < x < \pi$$
 in the simplest form.

4. Let A (1,3), B(0,0) and C(k,0) be the vertices of triangle ABC of area 3sq.

Units find k using determinantd method.



5. Prove that the greatest integer function $f: R \to R$ defined by f(x) = [x], where [x] indicates the greatest integer not greater than x, is neither one-one nor onto.

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6.
$$x=4t, y=rac{4}{t}$$
 then find $rac{dy}{dx}$

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7. Find the intervals in which the function f given by $f(x) = x^2 - 4x + 6$

is (a) strictly increasing (b) strictly decreasing.

8. Evaluate :
$$\int \sin 3x \cos 4x dx$$

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9. Evaluate :
$$\int \log x dx$$

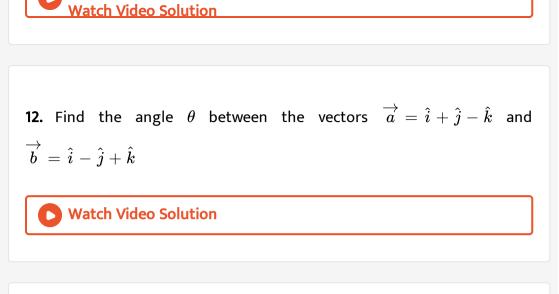
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10. Form the differential equation of the family of curves $rac{x}{a}+rac{y}{b}=1$ by

eliminating the constants 'a' and 'b'

11. If either a = 0, b = 0, then a.b=0. But the converse need not to be true

. Justify your answer with an example.



13. Find the distance between the parallel lines $\vec{r} = \hat{i} + 2\hat{j} - 4\hat{k} + m\left(2\hat{i} + 3\hat{j} + 6\hat{k}\right)$ and $\vec{r} = 3\hat{i} + 3\hat{j} - 5\hat{k} + n\left(2\hat{i} + 6\hat{k}\right)$ **Watch Video Solution**

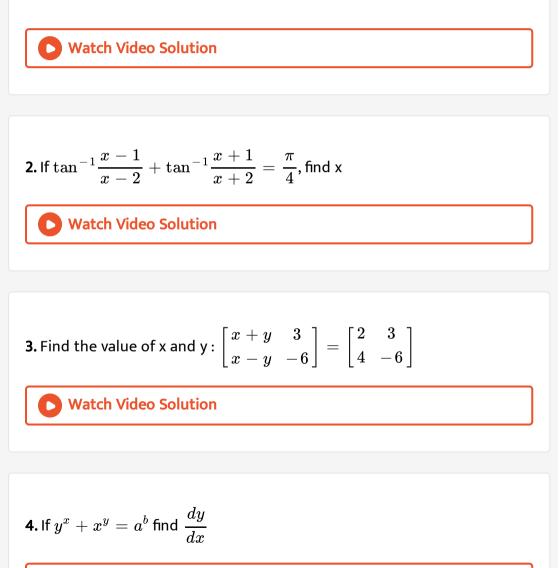
14. A fair die is rolled . Consider events $E = \{1, 3, 5\} F = \{2, 3\}$ and $G = \{2, 3, 4, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..., 2, ..$

5}. Find

P(E/F) and P(F/E)

1. Determine whether the relation R in the set A = $\{1,2,3,4,5,6\}$ as R = $\{(x,y) :$

y is divisible by x} is reflexive, symmetric and transitive.



5. Verify Mean value theorem for the function $f(x) = x^3 - 5x^3 - 3x$ in

the interval [a,b]

Where a=1 and b=3 Find all $c\in(1,3)$ For which f'(c)=0

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6. Find two positive numbers whose sum is 16 and the sum of whose cubes is minimum.

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

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8. Evaluate :
$$\int rac{1}{1+ an x} dx$$

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

y = 4.



10. Prove that the equation
$$x62rac{dy}{dx}=x^2-2y^2+xy$$
 is a homogenous

differential equation

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11. Find a vector perpendicular to each of the vectors $\vec{a} = 2\hat{i} + \hat{j} + 3\hat{k}, \vec{b} = 3\hat{i} + 5\hat{j} - 2\hat{k}$, which has magnitude 10 units

12. Show that the points A(-1,4,-3), B(3,2,-5) C(- 3,8,-5) and D (-3,2,1) are

coplanar

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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).

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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?



1. If
$$f \colon A o A$$
 defined by $f(x) = rac{4x+3}{6x-4}$ where $A = R - \left\{rac{2}{3}
ight\}$, show

that f is invertible and $f^{-1} = f$.

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2. Solve the following system of equations by matrix method.

x + 2y + 3z = 2

2x + 3y + z = -1

x-y-z=-2

3. If
$$y = (\tan^{-1} x)^2$$
 then show that
 $(x^2 + 1)^2 \frac{d^2 y}{dx^2} + 2x(x^2 + 1)\frac{dy}{dx} = 2$
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4. A particle move along the curve $6y = x^3 + 2$.Find the points on the curve at which y-coordinate is changing 8 times as fast as the x-coordinates.

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5. Find the integral of
$$\frac{1}{\sqrt{a^2 - x^2}}$$
 with respect to x, and hence evalute $\int \frac{dx}{\sqrt{5 - 4x - x^2}}$
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6. The area bounded by the circle $x^2 + y^2 = 2$ is equal to :

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

8. Derive the formula for the distance between two parallel lines $\overrightarrow{r} = \overrightarrow{a_1} + \lambda \overrightarrow{b}$ and $\overrightarrow{r} = \overrightarrow{a_2} + \mu \overrightarrow{b}$ in vector form.

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9. If a fair coin is tossed 8 times. Find the probability of

at most five heads.

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Part E

1. A manufacturer produces nuts and bolts . It takes 1 hr of work on machine A and 3 hr on machine B to produce a package of nuts and bolts . He earns a profit of Rs 17.50 per package on nuts and Rs 7.00 per

package on bolts . How many package of each should be produced each

most 12 h a day to maximize the profit?

