



# MATHS

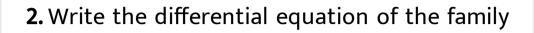
# **BOOKS - SHARAM PUBLICATION**

# **QUESTION PAPER 2014**



1. What do you mean by integration ? Write

your answer in one sentence.



of straight lines parallel to the y-axis.



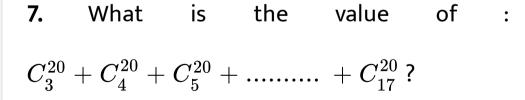
**3.** Is 
$$\stackrel{\rightarrow}{0}$$
 unique

4. Under which conditions the straight line  $\frac{x-a}{l} = \frac{y-b}{m} = \frac{z-c}{n}$  intersects the plane Ax + By + Cz = 0 at a point other than (a,b,c)?

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**5.** How many straight lines in space through the origin are equally inclined to the coordinate axes? 6. If  $a_{ij}$  is an element in ith row and jth column of a 3rd order determinant and  $c_{ij}$  be the cofactor of  $a_{ij}$ , then what is the value of  $a_{12}c_{12} - a_{21}c_{21} + a_{13}c_{13} - a_{31}c_{31}$ ?

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**8.** If an event A is independent of it self, then what is P(A)? Watch Video Solution  $rac{dy}{dx}$ 9. If  $y = \cos ec^{-1}x$ , then find and determine its value at x = -2. Watch Video Solution

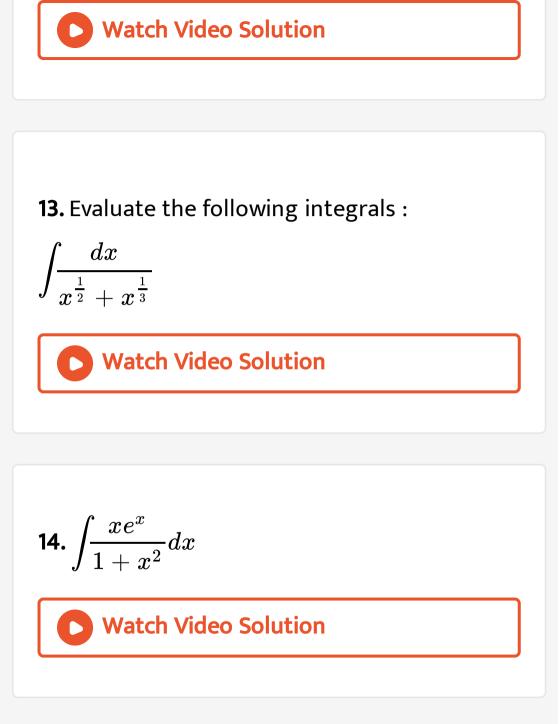
**10.** Examine the differentiability of  $\ln x^2$  for all

real values of x.

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**11.** Interpret Lagrange's mean value theorem geometrically.

**12.** Evaluate: 
$$\lim_{x \to 0} \left( \frac{\sin x}{x} \right)^{\frac{1}{x}}$$



**15.** Evaluate: 
$$\int\limits_{0}^{rac{3}{2}} ig[x^2ig] dx.$$

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16. Find the area of the region bounded by the curve  $y = \sin x$  and the straight lines  $x = -\frac{\pi}{4}, x = \frac{\pi}{4}$  and y = 0.

17. Solve the following differential equations

$$ig(1+y^2ig)dx+\Big(x-e^{- an^{-1}y}\Big)dy=0$$

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

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19. Find the differential equation whose general solution is  $ax^2 + by = 1$ , where a and





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

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**21.** Find the value of  $\lambda$  such that the following

vectors are coplanar: $-\,\hat{i}+\lambda\hat{j}-\lambda\hat{k},2\hat{i}+4\hat{j}+5\hat{k},\ -2\hat{i}+4\hat{j}-4\hat{k}$ 



**22.** Find the co-ordinates of the foot of the perpendicular from the point (1, 1, 1) on the line joining (1, 4, 6) and (54, 4).



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





24. Using the method of elemination find the symmetrical form of equation of the line 6x + 8y + 3z = 10 and x + 2y + z = 3.

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25. Solve the following LPP graphically

Maximize, Z = 20x + 30y

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

 $x, y \ge 0.$ 



**26.** If A and B are square matrices of same order, then show by means of an example that  $AB \neq BA$  in general.

27. If 
$$A = \begin{bmatrix} 0 & -\tan\left(\frac{\alpha}{2}\right) \\ \tan\left(\frac{\alpha}{2}\right) & 0 \end{bmatrix}$$
 show that  
 $(I+A) = (I-A) \begin{bmatrix} \cos \alpha & -\sin \alpha \\ \sin \alpha & \cos \alpha \end{bmatrix}$  where



**28.** Five cities A,B,C,D,E are connected to each other by straight roads. What is the total number of such roads?

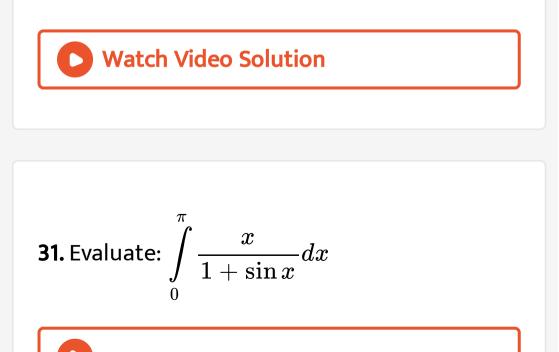
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**29.** Two balls are drawn from a bag containing 6 red and 4 yellow balls. Find the probability

that atleast one of the ball is yellow?



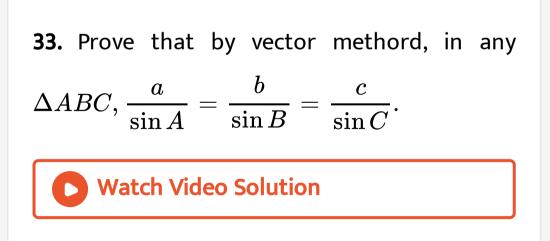
**30.** A person draws three cards at random one after another from a pack of 52 cards. Find the probability that all these cards are spades.





## **32.** Solve the following differential equations

 $(x + \tan y)dy = \sin 2ydx$ 



**34.** Find the equation of the sphere inscribed in a tetrahedron whose faces are x = 0, y = 0

, z=0 and 2x+2y+z=1.

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35. Solve the following LPP Maximise Z=20x+10ySubject to  $x+2y\leq 40,$  $3x+y\geq 30,$  $4x+3y\geq 60,$  $x,y\geq 0.$ 





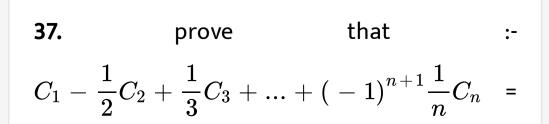
**36.** Solve the following system of equations by

the matrix inversion method.

x + y + z = 4

2x - y + 3z = 1

and 3x + 2y - z = 1



 $1+1/2 + \dots + 1/n$ 



**38.** The probability of a shooter hitting a target is  $\frac{3}{4}$  Find the minimum number of times he must fire, so that the probability of hitting the target atleast once is greater than 0.999.