



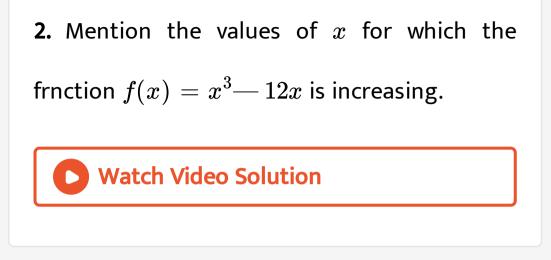
# MATHS

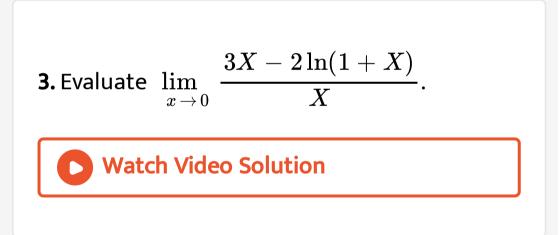
# **BOOKS - MODERN PUBLICATION**

# SAMPLE PAPER 2012



**1.** Differentiate  $a^{\ln x}$  with respect to x.





**4.** What is F'(t) if F(t) = 
$$\int_{a}^{t} e^{3x} \cdot \cos 2x dx$$
?





5. integrate 
$$\int \frac{3 + \cos x + \tan^2 x}{2x + \sin x + \tan x}$$

Watch Video Solution

6. Write the particular solution of the equation 
$$\frac{dy}{dx} = \sin x$$
 given that  $y(\pi) = 2$ .

7. Write the order and degree of the following

differential equation 
$$d^2rac{y}{dx^2}=2y^3+rac{\left(rac{dy}{dx}
ight)^4}{\sqrt{rac{d^2y}{dx^2}}}$$



#### 8. What is the point of intersection of the line

x = y = z with the plane x + 2y + 3z = 6?

9. To which coordinate axis is the plane 2x + 3z = 0 parallel ?

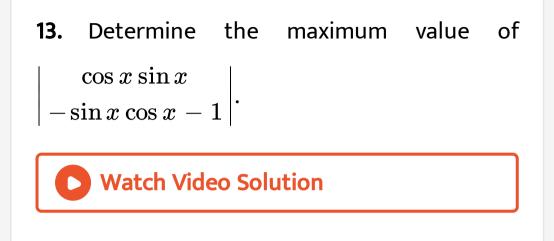
Watch Video Solution

10. Find the component of the vector  $\overrightarrow{b}=8\hat{i}+\hat{j}$  in the direction of the vector  $\overrightarrow{a}=\hat{i}+2\hat{j}-2\hat{k}.$ 

11. What is the minimum value of n if P(n, 2) > 131?

12. What is the probability of getting a total of

utmost 11 when two dice are thrown ?



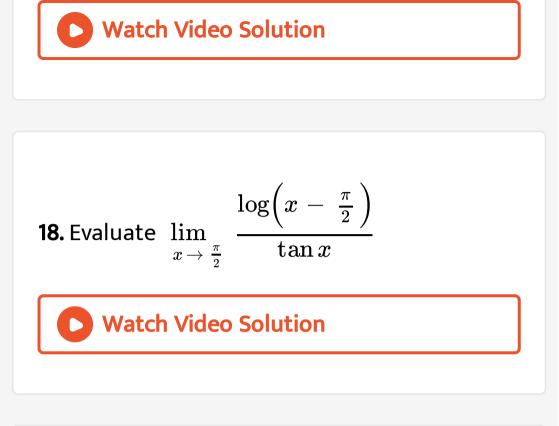
## 14. Write the solution of the following LPP

Maximise Z = x + y

Subject to  $3x+4y\leq 12, x\geq 0, y\geq 0$ 

15. Prove that , if 
$$y = \log \tan \left(\frac{\pi}{4} + \frac{x}{2}\right)$$
 , then  
 $\frac{dy}{dx} = \sec x$   
Watch Video Solution  
16. Differentiate with resi to x :  
 $Y = 2^{x^2} + \tan^{-1}\left(\frac{\cos x - \sin x}{\cos x + \sin x}\right)$   
Watch Video Solution

17. Find 
$$rac{\partial}{\partial y}\left(rac{\partial z}{\partial x}
ight)$$
 if  $z=x^y+y^x$ 



19. Find the equation of tangent to the curve

 $x=y^2-2$  at the points where slope of the

normal equal to (-2).

20. Integrate 
$$\int_{-3/5}^{3/5} [2x+1]dx$$

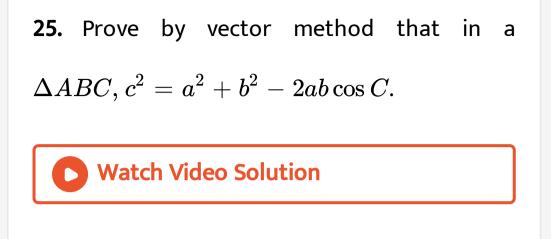
#### Watch Video Solution

21. Find the area of the region bounded by the

curve  $y = 6x - x^2$ , the X-axis and the two ordinates x = 0 and x = 9.

22. Solve 
$$y^2 + x^2 rac{dy}{dx} = xy rac{dy}{dx}.$$

Watch Video Solution  
23. Solve
$$(x \log x) \frac{dy}{dx}$$
+y=2 log x.  
Watch Video Solution  
24. Find a vector  $\overrightarrow{b}$  such that  $\overrightarrow{a} \times \overrightarrow{b} = \overrightarrow{c}$   
and  $\overrightarrow{a} \cdot \overrightarrow{b} = 3$ , where  
 $\overrightarrow{a} = \hat{i} + \hat{j} + \hat{k}, \ \overrightarrow{c} = \hat{j} - \hat{k}$ .  
Watch Video Solution

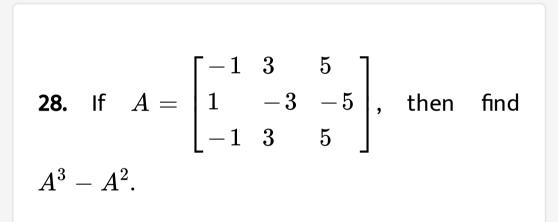


**26.** Find the co-ordinates of the point where the perpendicular from the origin meets the line joining the points (-9, 4, 5) and (11, 0, -1).

27. Solve for x,

$$egin{array}{ccccccc} 15-2x & 11 & 10 \ 11-3x & 17 & 16 \ 7-x & 14 & 13 \end{array} ert = 0$$

### Watch Video Solution



**29.** Find the value of the term free from X in

the expansion of 
$$\left(rac{3}{2}ig(x^2ig)-rac{1}{3x}
ight)^9$$

Watch Video Solution

**30.** A and B are two events. If  $P(A) = \frac{3}{8}$ ,  $P(B) = \frac{1}{2}$  and  $P(A \cap B) = \frac{1}{4}$ , then find  $P(A^c \cap B^c)$  and  $P(A \cap B^c)$ 

31. If A and B are independent events, show

that

 $A^c$  and  $B^c$  are independent,



32. Find 
$$rac{dy}{dx}$$
 $y = \cot^{-1}(\ln \cos ec^{-1}x)$ 

**33.** Evaluate the following integrals  $\int \frac{12\sin x - 2\cos x + 3}{\sin x + \cos x} dx$ 

# Watch Video Solution

$$\mathbf{34.} \int_0^\pi \frac{x dx}{1 + \sin x}$$

#### Watch Video Solution

35. 
$$\int \frac{1+x^2}{x\sqrt{x^4+1}} dx$$

**36.** Prove that the four points (0, 4, 3), (-1, -5,

-3), (-2, -2, 1) and (1, 1, -1) lie in one plane. Find

the equation of the plane.

Watch Video Solution

37. Solve by matrix inversion method.

x + y + z = 2

2x + y + z = 4

x + y - z = 1



