

SNS COLLEGE OF TECHNOLOGY



(An Autonomous Institution)
Coimbatore-641035.

UNIT 3 PARTIAL DIFFERENTIAL EQUATIONS

Solving first order PDE

Type-in claimants form z= px+qy+f(p1q) booking Rule! Complete Integral: Replace p- a and q > b Stroular Integral: 32 =0 and 32 =0 General Integral: put b= o(a) in complete Integral. 1. Solver Z= px+qy+pq. Son: Given z=px+qy+pq ->0 Complete Integral: Z= ax+by+ab [Roplace p+a, 976] Singular Integral: 82 =0 and 82 =0 2+b=0 y+a=0 b=-2 a=-Bub 'a'ond b' in @ z= -yx - xy -y(-x) => z= -xy General Integral: sub b = \phi(a) in @ Z = ax + \$6\$(a)y + a\$(a) →@ diff pust'a', 82 20 > x+ &'(a)y+ ap'(a)+ &(a)=0 >0 Eliminate 'a' blu (329) we get the general soln. 2. Solve! X= px+qy+ p2-q2 Seen Given z= px+ qy+p2-q2 >0 Z = ax + by + a2-b2 -> @ [Replace p > a & q > b] Complete Integral: Singular Integral:



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Sub @
$$+b$$
 in @ $+b$

$$2 = \frac{-x}{2}x + \frac{y}{4}y + \left(\frac{-x}{2}\right)^{2} - \left(\frac{y}{2}\right)^{2}$$

$$= \frac{-x^{2}}{2} + \frac{y^{2}}{2} + \frac{x^{2}}{2} - \frac{y^{2}}{4}$$

$$AI = -2x^{2} + 2y^{2} + x^{2} - y^{2}$$

$$= -x^{2} + y^{2}$$

$$\Rightarrow AZ = y^{2} - x^{2}$$
General Integral:

Sub $b = \phi(a)$ in @

$$I = ax + \phi(a)y + a^{2} - (\phi(a))^{2} \rightarrow \emptyset$$

$$Aiff p with a' , $\Rightarrow \frac{\partial Z}{\partial a} = 0$

$$\frac{\partial Z}{\partial a} \Rightarrow x + \phi'(a)y + 2a - 2\phi(a)\phi'(a) = 0 \rightarrow \emptyset$$
Fliminate a' blue @ $x \oplus y$ we get the general soun.$$