

# Assignment - 4 (PDE)

Course Teacher  
Koeli Ghoshal  
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Q1. Form p d e by eliminating arbitrary constants a and b from the following relations

(a)  $z = a(x+y)b$  (b)  $z = ax + by + ab$  (c)  $z = ax + a^2y^2 + b$

(d)  $z = axe^y + \frac{1}{2} \times a^2 e^{2y} + b$

[Ans: (a)  $p = a$  (b)  $z = x\beta + y\alpha + \beta\alpha$  (c)  $\alpha = 2y\beta^2$   
(d)  $\alpha = axe^y$   $x\beta + \beta^2$  ]

Q2. Form a p d e by eliminating  $\phi$  from

$\phi(x+y+z, x^2+y^2-z^2) = 0$

[Ans:  $(y+z)\beta - (x+z)\alpha = x-y$ ]

Q3. Test if  $\beta^2 + \alpha^2 = 1$  and  $(\beta^2 + \alpha^2)x = \beta z$  are compatible or not. If yes, solve them.

[Ans:  $z^2 = x^2 + (y+c)^2$ ]

Q4. Find a complete integral  $z = \beta x + \alpha y + \beta^2 + \alpha^2$

[Ans.  $z = ax + by + a^2 + b^2$ ]

Q5. Find a complete integral of  $z^2(\beta^2 z^2 + \alpha^2) = 1$ .

[Ans:  $9a^4 (ax+y+b)^2 = (a^2 z^2 + 1)^3$ ]

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