

Please show all the steps leading to the final answer

- (a) Solve the equation $u_{xy} = x^2y$ and its particular solution for which $u(x,0) = x^2$, $u(1, y) = \cos(y)$.
- (b) Determine whether each of the following partial differential equations is linear or nonlinear, state the order of the equation, and name the dependent and independent variables.
- i) $u_t = 9u_{yy}$
 - ii) $x^2P_{zz} = z^2P_{xx}$
 - iii) $WW_{rr} = pqr$
 - iv) $s_{xx} + s_{yy} + s_{zz} = 0$
 - v) $(x_x)^2 + (x_y)^2 = 10$

Please show all the steps leading to the final answer