



Assignment 1 - Mathematics-II
Departments: CSE,ECE,ENE
Pondicherry University

✉ Aasaimani Thamizhazhagan
✉ aasaimanit@pondiuni.ac.in

📅 Feb 27,2026 lecture
🏢 M05, RSMS Building

1. Form the partial differential equations by eliminating the arbitrary constants or arbitrary functions from the following:

- (a) $(x - a)^2 + (y - b)^2 + z^2 = 1$
- (b) $z = axe^y + \frac{1}{2}a^2e^{2y} + b$
- (c) $f(x^2 + z^2, y - xz) = 0$
- (d) $z = f_1(x)f_2(y)$

2. Solve by direct integration:

- (a) $\frac{\partial^2 z}{\partial x \partial y} = \frac{1}{xy}$
- (b) $\frac{\partial^2 z}{\partial x^2} = a^2 z$ given that when $x = 0$, $\frac{\partial z}{\partial x} = a \sin y$ and $\frac{\partial z}{\partial y} = 0$.
(Hint: Refer 16.4 solved examples and ODE from M1)

3. Solve the following Lagrange linear equations:

- (a) $(z - y)p + (x - z)q = y - x$
- (b) $x(y - z)p + y(z - x)q = z(x - y)$
- (c) $x^2p + y^2q = (x + y)z$
- (d) $z(xp - yq) = y^2 - x^2$

4. Solve the following equations:

- (a) $\frac{\partial^2 z}{\partial x^2} - 7\frac{\partial^2 z}{\partial x \partial y} + 6\frac{\partial^2 z}{\partial y^2} = \cos(y - 3x)$
- (b) $4\frac{\partial^3 z}{\partial x^3} - 3\frac{\partial^3 z}{\partial x \partial y^2} + \frac{\partial^3 z}{\partial y^3} = 6x^2y^2$
- (c) $(4D_x^2 D_y - 4D_x D_y^2 + D_y^3)z = (y - 1)e^x$

(Hint: Interchange x to y and do the same in the final solution (OR) find the characteristic directions from factoring! You will have to use general method of finding P.I.)