

Ref.

Partial differential Equation

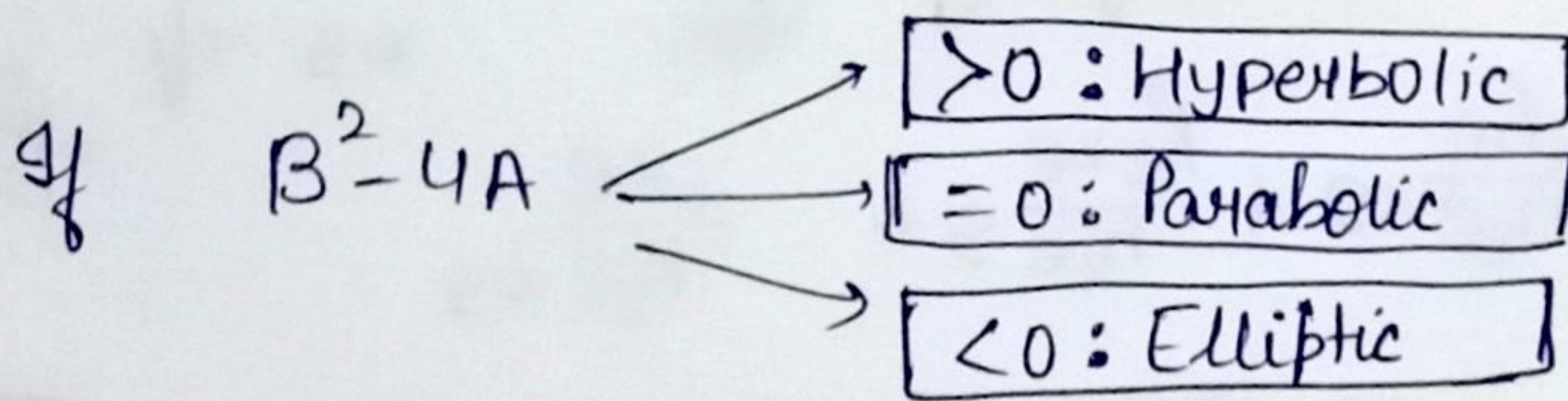
Date

$$\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial u}{\partial x \partial y} + \frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} + u = 0.$$

u is depending on x, y and x, y are independent

Second order partial differential equation of $u(x, y)$ written in the general form.

$$A \frac{\partial^2 u}{\partial x^2} + B \frac{\partial^2 u}{\partial y^2} + C \frac{\partial^2 u}{\partial x \partial y} + D \frac{\partial u}{\partial x} + E \frac{\partial u}{\partial y} + Fu + G = 0.$$



Question

$$\frac{\partial^2 u}{\partial x^2} + 5 \frac{\partial u}{\partial x} + 6u = 0.$$

Soln.

$$1 \cdot \frac{\partial^2 u}{\partial x^2} + 0 \cdot \frac{\partial^2 u}{\partial y^2} + 0 \cdot \frac{\partial^2 u}{\partial x \partial y} + 5 \frac{\partial u}{\partial x} + 6u = 0$$

$$\begin{aligned} A &= 1 \\ B &= 0 \\ C &= 0 \end{aligned}$$

$$B^2 - 4AC = (0)^2 - 4(1)(0) = 0$$

Parabolic