REVISION

Techniques to Solve First order D.E

Type 1:

1) $\frac{dy}{dx} = f(x) \Rightarrow y = \int f(x)\,dx$

only function of x → directly integrate.

Type 2:

2) $\frac{dy}{dx} = f(x,y) \longrightarrow$ function of both x and y — see if they are seperable

$$f(x,y) = X(x) \cdot Y(y)$$

then. $\left.\int \frac{dy}{Y(y)} = \int X(x)\,dx \right\} \to$ Solution

Type 3: Non-seperable. but homogeneous.

$$M(x,y)\,dx + N(x,y)\,dy = 0$$

M and N are homogenous functions of same degree.

then.

$$\frac{dy}{dx} = f(x,y) = \frac{-M(x,y)}{N(x,y)}$$

make transformation $z = \frac{y}{x}$

and $\frac{dy}{dx} = z + x \cdot \frac{dz}{dx}$

solve $z = z(x) \xrightarrow[z = y/x]{} y(x)$

Homogeneous D.E → Seperable form.