Assignment 2

AI1110: Probability and Random Variables

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(ICSE Class 12, Exercise 11.B) solve: sinx $\frac{dy}{dx} - y = sinx.tan\frac{x}{2}$

Solution.

$$\frac{dy}{dx} - y = sinx.tan\frac{x}{2} \tag{1}$$

The general solution to this equation solved by taking integral factor:

- $sinx.\frac{dy}{dx} - y = sinx.tan(\frac{x}{2})$
- $\frac{dy}{dx} - \frac{y}{sinx} = tan(\frac{x}{2})$
- integral factor of the above equation is 1/tan(x/2)
- $\frac{y}{tan(\frac{x}{2})}dx = \int tan(\frac{x}{2})\frac{1}{tan(\frac{x}{2})} + c$
- $\frac{y}{tan(\frac{x}{2})} = x + c$
- $y = x.tan(\frac{x}{2}) + c.tan(\frac{x}{2})$

$\therefore$ The solution to the equation is $y = x.tan(\frac{x}{2}) + c.tan(\frac{x}{2})$