

[2]

$$F(y, y', y'') = 0$$

معادله فاقد x باشد

$$\Rightarrow \boxed{y'' = u \frac{du}{dy}}, \quad \boxed{y' = u}$$

جواب $y'' = y'(y' + y) \quad , \quad y(0) = 0, \quad y'(0) = 1$

$$u \frac{du}{dy} = y(u + y) \Rightarrow u' = u + y$$

$$\mu = e^{\int -dy} = e^{-y}$$

$$\Rightarrow u' - u = y$$

خطی
مستقیم

$$\Rightarrow u = e^y \times \left[\int y e^{-y} dy + c \right]$$

$$= e^y \times \left[-(1+y) e^{-y} + c \right] \quad (*)$$

$$u = y' \Rightarrow y'(0) = 1 \Rightarrow \boxed{c = 0}$$

$$\Rightarrow y' = (1+y) \Rightarrow \frac{dy}{1+y} = dx$$

(*)

$$\int \frac{1}{1+y} = \ln(1+y)$$

$$\ln(1+y) = x + c$$

$$\Rightarrow 1+y = e^{x+c}$$

$$= \boxed{y = c' e^x - 1}$$