duction of Order

$$\frac{e^{-\int P(x)dx}}{y_1^2}dx$$

$$x)y=0 \quad c_1 e^{x}$$

$$Q_{13} \quad x^2 y'' - xy' + 2y = 0, \quad y_1 = x\sin(\ln x)$$

$$y'' \boxed{-\frac{1}{x}} y' + \frac{2}{x^2} y = 0$$

$$y_2 = x\sin(\ln x) \int \frac{e^{-\int(-\frac{1}{x})dx}}{[x\sin(\ln x)]^2} dx$$

$$\left(\begin{array}{l} \ln x \\ e = x \end{array} \right.$$

$$y_2 = x\sin(\ln x) \int \frac{x \cdot c_1}{x^2 \sin^2(\ln x)} dx$$

$$= c_1 x\sin(\ln x) \int \boxed{\frac{1}{x}} \csc^2(\ln x) \, dx$$

$$\text{Let } u = \ln x \Rightarrow du = \frac{1}{x} dx$$

$$= x\sin(\ln x) \int \csc^2 u \cdot du$$

$$= c_1 x\sin(\ln x)(-\cot u) + c_2$$

$$= c_1 x\sin(\ln x) \cdot \cot(\ln x) + c_2$$