$$\frac{dy}{dx} + y = 0$$

$$\frac{dy}{dx} + y = e^{x}$$

$$\frac{dy}{dx} + 2y = 0$$

$$\frac{dy}{dx} + 2y = e^{-x}$$

$$\frac{dy}{dx} - y = 0$$

$$\frac{dy}{dx} - y = e^{-x}$$

$$\frac{dy}{dx} + 7y = 2e^{3x}$$

$$\frac{dy}{dx} + 7y = 2x$$

$$x\frac{dy}{dx}+y=sin\left(x\right)$$

$$\frac{dy}{dx}+y=\cos\left(x\right)$$

$$x\frac{dy}{dx}+y=x^2$$

$$\frac{dy}{dx}+2y=e^{-2x}$$

$$\frac{d^2y}{dx^2} - y = 0$$

$$\frac{d^2y}{dx^2} + 5\frac{dy}{dx} + 6y = 0$$

$$\frac{d^2y}{dx^2}+\frac{dy}{dx}-2y=0$$

$$\frac{d^2y}{dx^2}+4\frac{dy}{dx}+4y=0$$

$$\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + 5y = 0$$

$$\frac{d^2y}{dx^2} + 2\frac{dy}{dx} - 3y = 6$$

$$\frac{d^2y}{dx^2} - \frac{dy}{dx} + 5y = 3$$

$$\frac{d^2y}{dx^2} - \frac{dy}{dx} = 2\sin\left(x\right)$$

$$\frac{d^2y}{dx^2} - 3\frac{dy}{dx} + 2y = 5e^x$$

$$\frac{d^2y}{dx^2} - 6\frac{dy}{dx} + 9y = e^{2x}$$

$$\frac{d^2y}{dx^2} - \frac{dy}{dx} + 5y = 2\sin(x)$$

$$\frac{d^2y}{dx^2} - \frac{dy}{dx} - 2y = 5e^x$$

$$\frac{d^2y}{dx^2} - 3\frac{dy}{dx} + 2y = 5e^x$$

$$\frac{d^2y}{dx^2} - 6\frac{dy}{dx} + 9y = e^{3x}$$

$$\frac{d^2y}{dx^2}+2\frac{dy}{dx}+2y=\cos\left(x\right)$$

Find the exact solution if $(0,1)$ and $\left(\frac{\pi}{2},\frac{2}{5}\right)$

are solutions