1. $\lambda^2+3\lambda-4=0 \rightarrow (\lambda+4)(\lambda-1)=0$ $\quad \lambda=-4,1$ $\quad \boxed{y=C_1e^{-4x}+C_2e^{x}}$

2. $\lambda^2+6\lambda+13=0$ $\quad \frac{-6\pm\sqrt{\cancel{36-52}}}{2}$ $\quad 2\sqrt{3}$ $\quad \lambda=-3+i\sqrt{3},\ -3-i\sqrt{3}$

$\boxed{y=C_1e^{-3}(\cos(\sqrt{3})+i\sin(\sqrt{3}))+C_2e^{-3}\cdot(\cos(\sqrt{3})-i\sin(\sqrt{3}))}$

3. $\lambda^2+2\lambda+1=0$ $\quad \lambda=-1$ $\quad y=C_1e^{-x}+C_2xe^{-x}$ $\quad C_1=1$ $\quad y'=-C_1e^{-x}+C_2(e^{-x}-xe^{-x})$ $\quad C_2-C_1=0 \rightarrow C_2=1$ $\quad \boxed{y=e^{-x}+xe^{-x}}$

4. $\lambda^2+5\lambda=0$ $\quad \lambda=0,-5$ $\quad \boxed{y=C_1+C_2e^{-5x}}$

5. $\lambda^2-16\lambda=0$ $\quad \lambda=0,16$ $\quad \boxed{y=C_1+C_2e^{16x}}$

6. $\lambda^2+16\lambda=0$ $\quad \lambda=0,-16$ $\quad \boxed{y=C_1+C_2e^{-16x}}$

$e^{ix}=\cos(x)+i\sin x$ $\qquad \sqrt{3}$