**42)**

**Using 10 we got in class:**

$y=\frac{1}{e^{2}+1}e^{x}+\frac{e^{2}}{e^{2}+1}e^{x}=\frac{e^{x}+e^{2}e^{-x}}{e^{2}+1}\rightarrow \left(1\right)$

**Now use (11), we get:**

$y=c\_{1}coshx+c\_{2}sinhx$

$$1=y\left(0\right)=c\_{1}$$

$$0=y^{'}\left(1\right)=\left(\frac{e-e^{-1}}{2}\right)+c\_{2}(\frac{e+e^{-1}}{2})$$

**Then c equal to**

$$c\_{2=}\frac{1-e^{2}}{1+e^{2}}$$

**Then**

$$y=coshx+\left(\frac{1-e^{2}}{1+e^{2}}\right)sinhx⇒y=\frac{e^{x}+e^{-x}}{2}+\left(\frac{1-e^{2}}{1+e^{2}}\right) \frac{e^{x}-e^{-x}}{2}$$

**Then we get:**

$$y=\frac{e^{x}+e^{2}e^{x}}{1+e^{2}}\rightarrow (2)$$

**You can see that they have the same answer**