Practice Questions of Lecture 10 to 12

Q #1: Prove that $\cos ec^{-1} z = \frac{1}{i}\log\left(\frac{i+\sqrt{z^2-1}}{z}\right), \quad z \in \mathbb{C}$.

Q #2: Separate into real and imaginary parts of $\tan^{-1}(x+iy)$.

Q #3: For any complex number z, prove that $\sinh^{-1} z = \log(z+\sqrt{z^2+1})$.

Q #4: Find $\text{Log}\, z$ if

(i) $z = 2i$ (ii) $z = -i$

(iii) $z = x,\ x > 0$ (iv) $z = 1+\sqrt{3}i$