Quiz 2 Math 1199 Fall 2019

$$\text{Arccos}\left(\tfrac{1}{2}\right) \overset{\text{def}}{=} \frac{1}{i}\text{Log}\left(\tfrac{1}{2}+\sqrt{\left(\tfrac{1}{2}\right)^2-1}\right)$$

$$= \frac{1}{i}\text{Log}\left(\tfrac{1}{2}+\sqrt{-\tfrac{3}{4}}\right)$$

$$= \frac{1}{i}\text{Log}\left(\tfrac{1}{2}+i\,\tfrac{\sqrt{3}}{2}\right)$$

$$= \frac{1}{i}\left[\ln\underbrace{\left|\tfrac{1}{2}+i\,\tfrac{\sqrt{3}}{2}\right|}_{=1} + i\underbrace{\text{Arg}\left(\tfrac{1}{2}+i\,\tfrac{\sqrt{3}}{2}\right)}_{=\pi/3}\right]$$

$$= \frac{1}{i}\left[\overbrace{\ln(1)}^{=0} + i\,\frac{\pi}{3}\right]$$

$$= \frac{\pi}{3}$$