Sec 35 prob 16 page 109:

$\cos(z) = 2$

$\shortparallel$

$\dfrac{e^{iz} + e^{-iz}}{2}$. $z = x + iy$

Set $w = e^{iz}$. Then $\dfrac{w + \frac{1}{w}}{2} = 2 \iff w^2 - 4w + 1 = 0$

$w_{1,2} = 2 \pm \sqrt{3}$.

Write $z = x + iy$. So $e^{iz} = e^{-y+ix}$

So $e^{-y+ix} = 2 \pm \sqrt{3}$, which is real and positive.

$\qquad \shortparallel$

$e^{-y} e^{ix}$

Now $e^{-y} > 0$. Hence e^{ix} is real and positive and is hence $= 1$. So $x = 2k\pi$, k integer.

$e^{-y} = 2 + \sqrt{3}$ or $2 - \sqrt{3}$. Both are positive.

So $-y = \ln(2+\sqrt{3})$ or $\ln(2-\sqrt{3})$

$(2+\sqrt{3})(2-\sqrt{3}) = 1$.

So $\ln(2-\sqrt{3}) = -\ln(2+\sqrt{3})$.

Hence, $y = \pm \ln(2+\sqrt{3})$

Hence, $z = 2k\pi \pm i\ln(2+\sqrt{3})$, k integer.