

MAT 01901 Opgave E22

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Vi skal løse ligningen

$$\frac{1}{z} + \frac{2e^{i\pi/3}}{z-1} = 0$$

Vi finder, da

$$e^{i\frac{\pi}{3}} = \frac{1}{2} + i\frac{\sqrt{3}}{2}$$

at

$$\begin{aligned} \frac{1}{z} + \frac{2e^{i\pi/3}}{z-1} = 0 &\iff \frac{1}{z} + \frac{1+i\sqrt{3}}{z-1} = 0 \\ &\iff z-1 + (1+i\sqrt{3})z = 0 \iff z(2+i\sqrt{3}) = 1 \\ &\iff z = \frac{1}{2+i\sqrt{3}} = \frac{2-i\sqrt{3}}{(2+i\sqrt{3})(2-i\sqrt{3})} = \frac{2-i\sqrt{3}}{7} \end{aligned}$$

Løsningen er altså

$$z = \frac{2}{7} - i\frac{\sqrt{3}}{7}$$