Q: Z平面转S平面，求damping ratio

Example 11.2 — Lect3 . P13

close-loop poles at $0.888 \pm j0.173$

Solution ① Z平面 $a \pm bj \rightarrow r \angle \theta$

method 1: $r = \sqrt{a^2 + b^2}$ $\theta = \tan^{-1}\left(\frac{b}{a}\right)$

method 2:

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菜单 → 2:复数 → $0.888 + 0.173i$

→ OPTN → ↓ → 1: $r\angle\theta$ → =

$0.905\angle +0.1924$ radians

0.193 → ppt错]

$$\zeta = -\frac{\ln r}{\sqrt{\ln^2 r + \theta^2}}$$

$$= -\frac{\ln 0.905}{\sqrt{\ln^2 0.905 + 0.193^2}}$$

$$= 0.46 \quad \checkmark$$

② $z = e^{sT}$ $\quad s = \frac{\ln z}{T}$ $\quad s = \sigma + j\omega$

$0.905 \angle 0.193 \quad T = 0.1$

$\sigma = \frac{\ln 0.905}{0.1} = -0.9982$

$w = \frac{\ln 0.193}{0.1} = -16.4507$

$S = -0.9982 - j16.4507$