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System Simulation
Midterm Problem 4

A) corrector is 4th order accurate since it satisfies 4 of lamberts equations

$$H_c(z) = \frac{T\left(\frac{70}{151}z^2 + \frac{44}{151}z - \frac{48}{151}\right)}{\left(z^2 - \frac{256}{151}z + \frac{85}{151}\right)}$$

B) $pLTE_c = \frac{C_c}{C_p - C_c} \cdot T$

as found in 2B, $C_p = \frac{5}{11}$ and $C_c = \frac{49}{302}$

$$pLTE_c = \frac{\frac{49}{302}}{\frac{5}{11} - \frac{49}{302}} \cdot T = \boxed{\frac{539}{971}T} = \boxed{0.5551 \cdot T}$$

C) see attached matlab

D) stable + accurate: $T = \frac{1}{4}$ (so $\lambda T = -1$)

E) both stability regions have that bulge-looking thing on the right side of their centers, with the predictors reaching into the positive, this is the inaccurate area of both. The stable + accurate regions are also similar for both, which I think is a good thing.