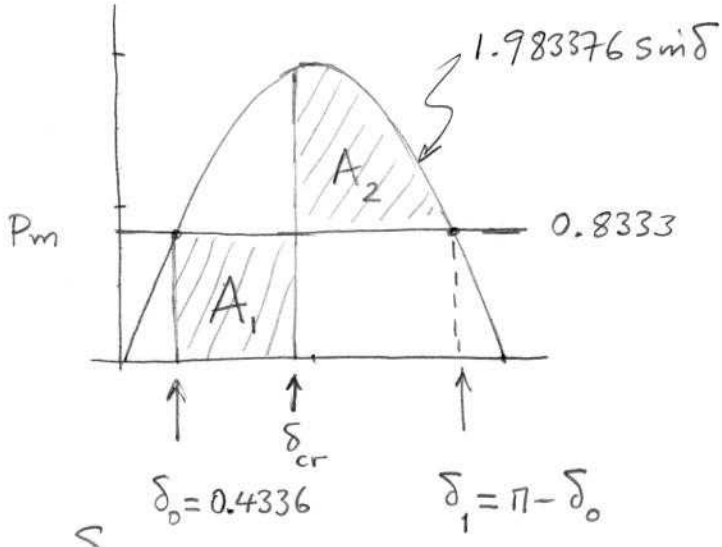

$$A_1 = \int_{\delta=\delta_0}^{\delta_{cr}} (0.8333 - 0)\, d\delta = 0.8333\,\delta_{cr} - 0.3613$$

$$A_2 = \int_{\delta=\delta_{cr}}^{\delta_1} (1.983376 \sin\delta - 0.8333)\, d\delta = -1.983376(\cos\delta_1 - \cos\delta_{cr}) - 0.8333(\delta_1 - \delta_{cr})$$

$$A_1 = A_2 \Rightarrow -0.3613 = 1.79983 + 1.983376\cos\delta_{cr} - 2.25656$$

$$\Rightarrow \cos\delta_{cr} = 0.04812$$

$$\Rightarrow \delta_{cr} = 1.52266$$

$$\delta(t_{cr}) = 28.0505\, t_{cr}^2 + 0.4336 = 1.52266$$

$$\Rightarrow t_{cr} = 0.19704 \text{ sec.}$$