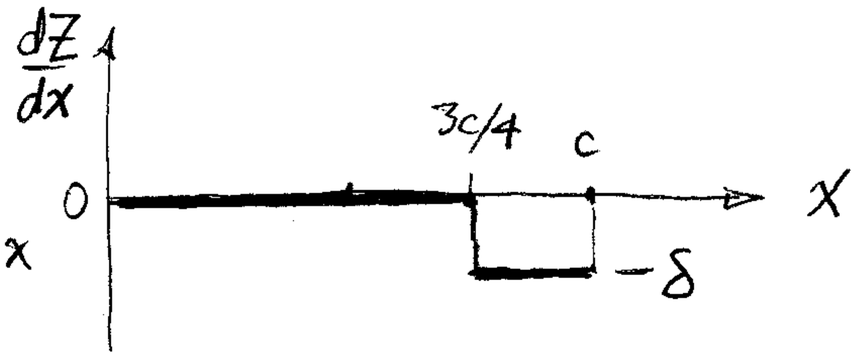
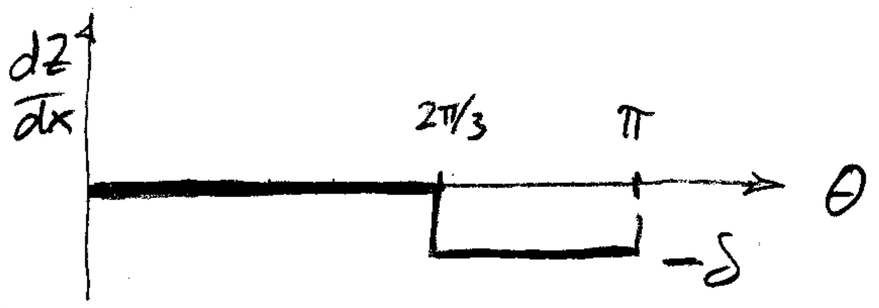
a)



$\frac{x_h}{c} = 0.75, \quad \theta_h = \arccos\left(1 - 2\frac{x_h}{c}\right) = \frac{2\pi}{3}$



b) $A_0 = \alpha - \frac{1}{\pi}\int_0^{\pi} \frac{dz}{dx}\, d\theta = \alpha - \frac{1}{\pi}\int_{\frac{2\pi}{3}}^{\pi} -\delta\, d\theta = \alpha - \frac{1}{\pi}\left(\pi - \frac{2\pi}{3}\right)(-\delta) = \alpha + \frac{1}{3}\delta$

$A_1 = \frac{2}{\pi}\int_0^{\pi} \frac{dz}{dx}\cos\theta\, d\theta = \frac{2}{\pi}\int_{\frac{2\pi}{3}}^{\pi} -\delta\cdot\cos\theta\, d\theta = \frac{2}{\pi}(-\delta)\left(\sin\theta\Big|_{\frac{2\pi}{3}}^{\pi}\right. = 0.551\,\delta$

$A_2 = \frac{2}{\pi}\int_0^{\pi} \frac{dz}{dx}\cos 2\theta\, d\theta = \frac{2}{\pi}\int_{\frac{2\pi}{3}}^{\pi} -\delta\cos 2\theta\, d\theta = \frac{2}{\pi}(-\delta)\left(\frac{\sin 2\theta}{2}\Big|_{\frac{2\pi}{3}}^{\pi}\right. = -0.276\,\delta$

$$\boxed{\begin{aligned} C_\ell &= \pi(2A_0 + A_1) = 2\pi(\alpha + 0.609\,\delta) \\ C_{m,c/4} &= \frac{\pi}{4}(A_2 - A_1) = -0.649\,\delta \end{aligned}}$$

c) $$\boxed{\begin{aligned} \frac{\partial C_\ell}{\partial \delta} &= 2\pi\cdot 0.609 = 3.826 \\ \frac{\partial C_m}{\partial \delta} &= -0.649 \end{aligned}}$$