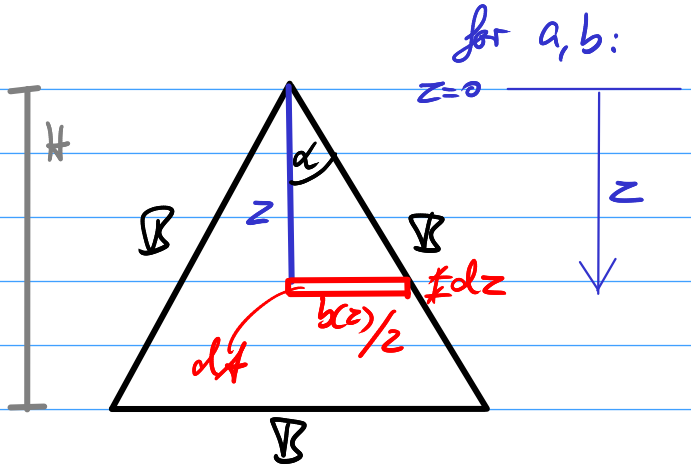
Task 2.5

Trigonometry gives:

$$b(z) = 2z \tan\alpha$$



$$dF = p(z)\, dA$$
$$= p(z)\, b(z)\, dz$$

$H = B\cos\alpha$

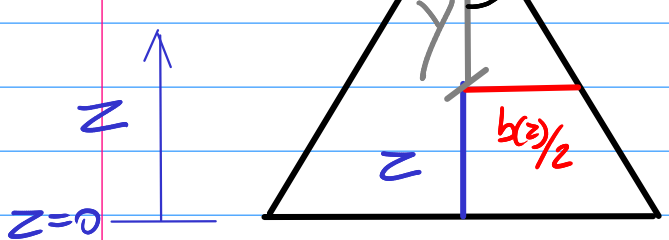
$$F_S = \int_0^H dF = \int_0^H p(z)\, b(z)\, dz$$

again $p(z) = p_e(z) - p_T(z)$

$$\left.\begin{aligned} p_e(z) &= p_a + gz \\ p_T(z) &= p_a \end{aligned}\right\} \quad p_e - p_T = gz$$

a,b) ⇒ proceed like in exercise solution

c)



from a,b:

$$b(y) = 2y\tan\alpha$$

$y = H - z$ here in c)

$$\Rightarrow b(z) = 2(H-z)\tan\alpha$$

for c)

Need correct formulae for pressure:

$$p_e(z) = p_a + \rho g (H - z)$$

$$p_T = p_a$$

$$p(z) = p_e(z) - p_T(z)$$

$$= \rho g (H - z)$$

with $H = \sqrt{3}\cos\alpha$

$\Rightarrow$ F_S as in example solution (cf. p. 18)

to be continued ....