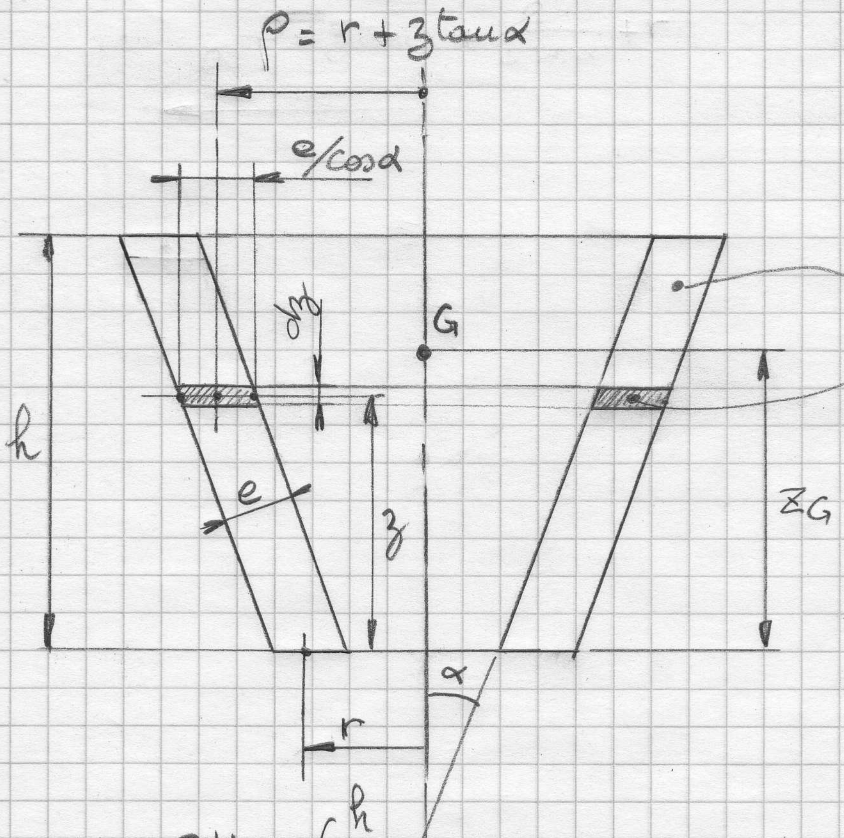
On connait r, e, h et α

→ TROUVER z_G



$$z_G = \frac{\Sigma(dv \cdot z)}{V}$$

$$dv = 2\pi\rho \cdot \frac{e}{\cos\alpha} \cdot dz$$

$$dv = \frac{2\pi \cdot e\,(r + z\tan\alpha)}{\cos\alpha} \cdot dz$$

$$V = \frac{2\pi e}{\cos\alpha}\int_0^h (r + z\tan\alpha) \cdot dz = \frac{2\pi e}{\cos\alpha}\int_0^h r\,dz + z\tan\alpha\,dz$$

$$V = \frac{2\pi e}{\cos\alpha}\left[r \cdot z + \frac{z^2}{2}\tan\alpha\right]_0^h = \frac{2\pi e}{\cos\alpha}\left(rh + \frac{h^2\tan\alpha}{2}\right) = \frac{\pi e h}{\cos\alpha}(2r + h\tan\alpha)$$

$$\Sigma dv \cdot z = \frac{2\pi e}{\cos\alpha}\int_0^h (r + z\tan\alpha) \cdot dz \cdot z = \frac{2\pi e}{\cos\alpha}\int_0^h rz \cdot dz + z^2\tan\alpha \cdot dz$$

$$= \frac{2\pi e}{\cos\alpha}\left[r\frac{z^2}{2} + \frac{z^3}{3}\tan\alpha\right]_0^h = \frac{2\pi e}{\cos\alpha}\left(r \cdot \frac{h^2}{2} + \frac{h^3}{3}\tan\alpha\right)$$

$$z_G = \frac{\Sigma dv \cdot z}{V} = \frac{\frac{2\pi e h^2}{\cos\alpha}\left(\frac{r}{2} + \frac{h\tan\alpha}{3}\right)}{\frac{\pi e h}{\cos\alpha}(2r + h\tan\alpha)} = 2h\,\frac{\left(\frac{r}{2} + \frac{h}{3}\tan\alpha\right)}{2r + h\tan\alpha}$$

$$\boxed{z_G = \frac{h\left(r + \frac{2}{3}h\tan\alpha\right)}{(2r + h\tan\alpha)}}$$