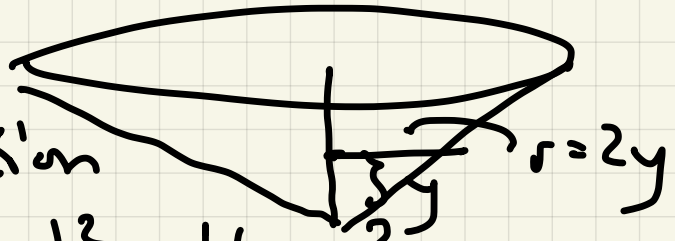
Quiz 6



(a) $r = 2y$, so cross section

Area is $\pi r^2 = \pi (2y)^2 = 4\pi y$

distance is $3 - y$

endpoints $0 \le y \le 2$

$$\therefore W = \int_0^2 (40) \cdot 4\pi y^2 (3-y)\, dy = 160\pi \int_0^2 3y^2 - y^3$$

$$= 160\pi \left(y^3 - \frac{y^4}{4} \right)_0^2 = 160\pi (8-4) = 640\pi \text{ ft-lbs}$$

(b) distance $= 3 - y + 15 = 18 - y$

so $W = \int_0^2 (40) 4\pi y^2 (18-y)\, dy$