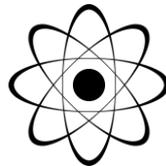


# Captain's Fight 2

FPT 2019  
February 8-9<sup>th</sup>





1) Question

2) Solution

**You have 2 minutes to solve the following question :**

“

United Kingdom is about to brexit. In a protectionist impulse, it was decided to fill the Channel Tunnel with concrete. How much concrete would be needed, in kilogram ?



1) Question

2) Solution

❁ Channel Tunnel length,  $L = 50.45$  km

❁ 3 tunnels of diameter 7.6 m, 7.6 m and 4.8 m

❁ Concrete density,  $\rho = 2400$  kg.m<sup>-3</sup>

$$M = \rho L \pi (r_1^2 + r_2^2 + r_3^2) = 2400 \times 50.45 \cdot 10^3 \times \pi (3.8^2 + 3.8^2 + 2.4^2)$$

$$\Rightarrow M = 1.3 \times 10^{10} \text{ kg}$$