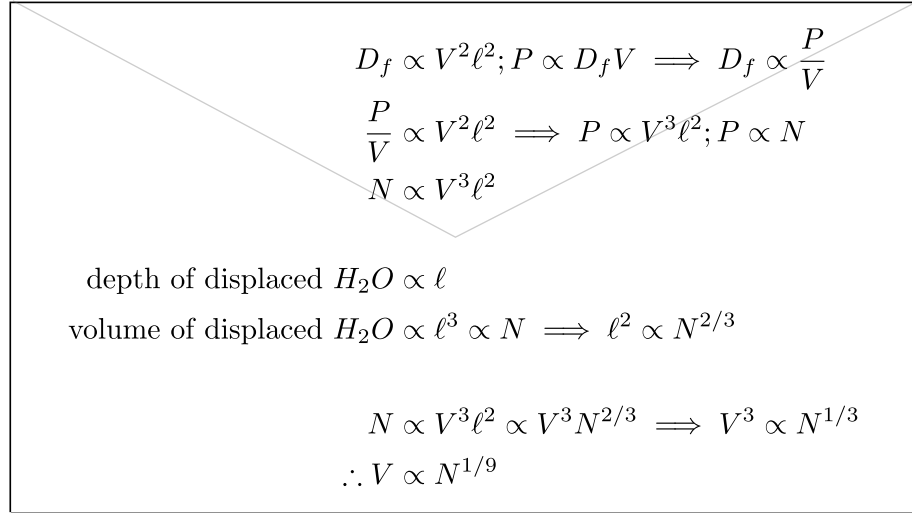


1 Exercise 1



$$D_f \propto V^2 \ell^2; P \propto D_f V \implies D_f \propto \frac{P}{V}$$

$$\frac{P}{V} \propto V^2 \ell^2 \implies P \propto V^3 \ell^2; P \propto N$$

$$N \propto V^3 \ell^2$$

depth of displaced $H_2O \propto \ell$

volume of displaced $H_2O \propto \ell^3 \propto N \implies \ell^2 \propto N^{2/3}$

$$N \propto V^3 \ell^2 \propto V^3 N^{2/3} \implies V^3 \propto N^{1/3}$$

$$\therefore V \propto N^{1/9}$$

Figure 1: The above figure shows the back of the actual envelope on which the power law scaling of shell velocity, V , as a function of total oarspeople, N , was derived.

2 Exercise 2

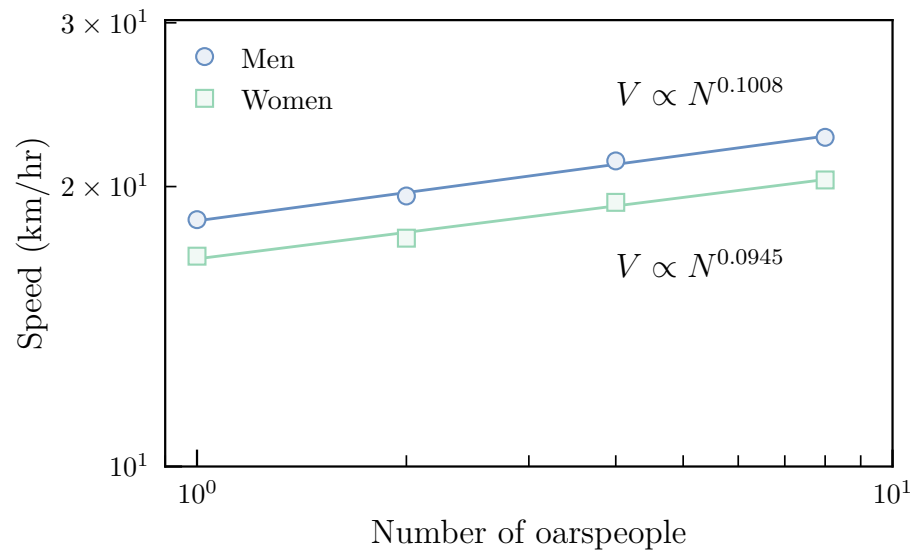


Figure 2: INSERT CAPTION

3 Exercise 3

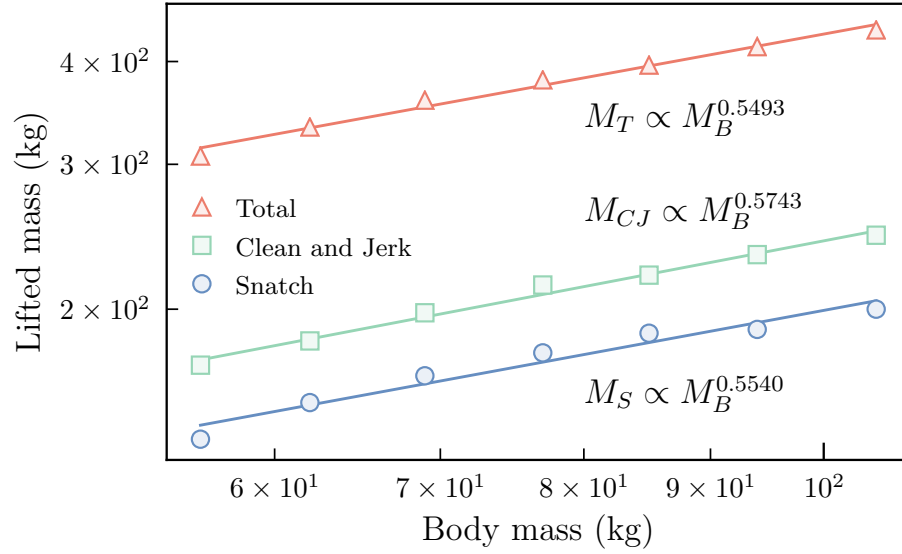


Figure 3: INSERT CAPTION

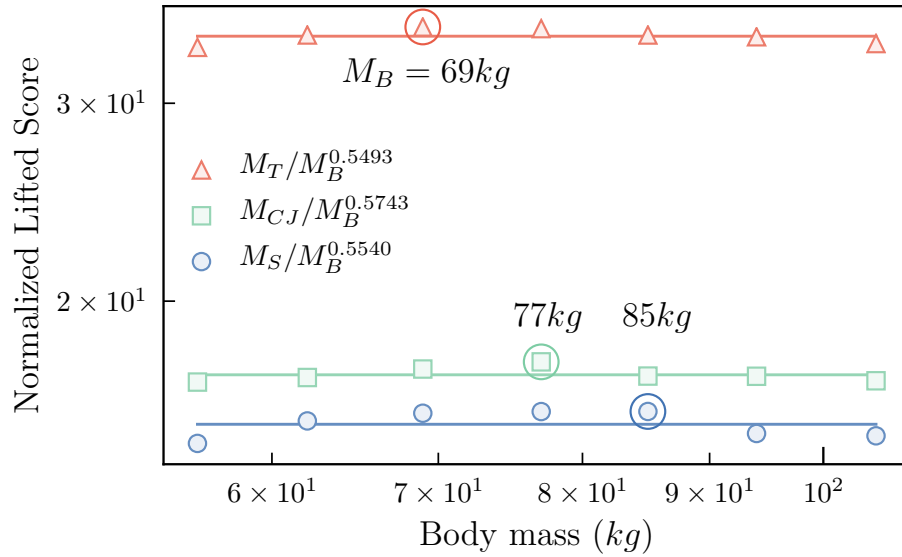


Figure 4: INSERT CAPTION

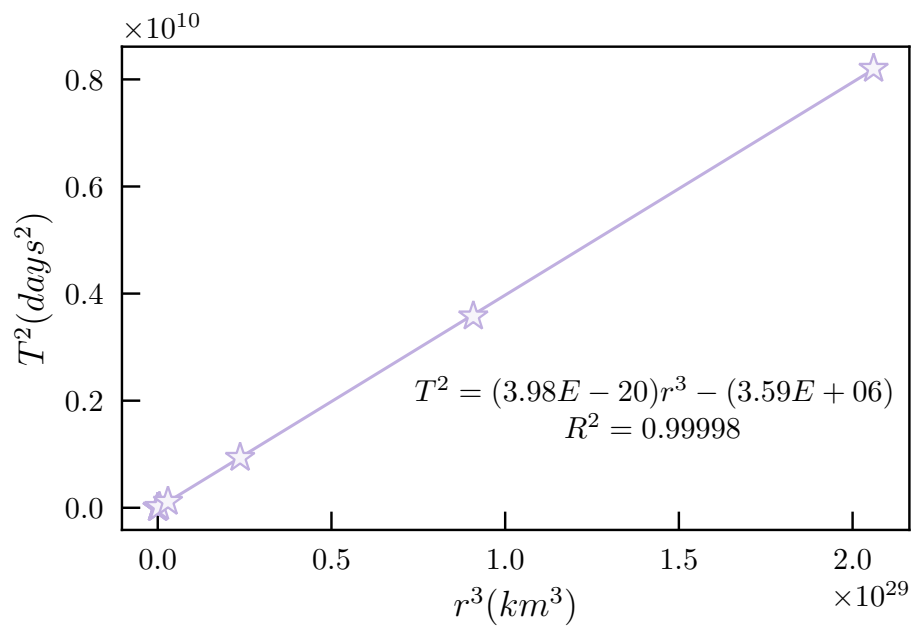
4 Exercise 4**5 Exercise 5****6 Exercise 6****7 Exercise 7**

Figure 5: INSERT CAPTION

8 Exercise 8