Treadmill

- Example
  - → 60kg (588.6N) subject, speed $200 m \cdot min^{-1}$, 7.5 % grade for 10 min

  - → Vertical displacement = % grade x distance

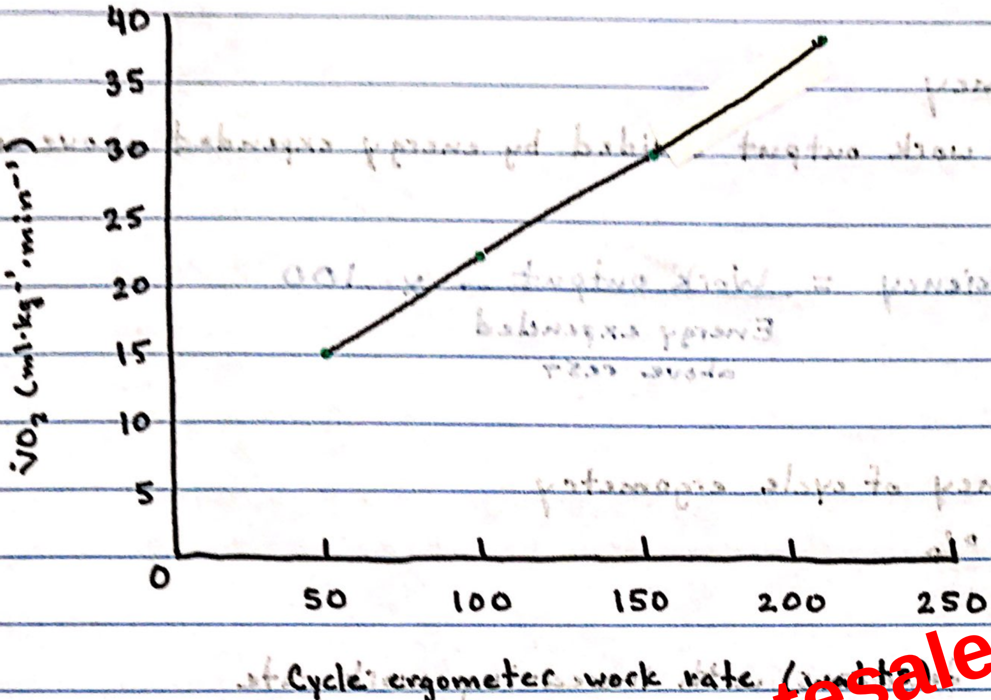
① $0.075 \times 200 m \cdot min^{-1} \times 10 min = 150m$

- Work = body weight x total vertical distance

② $588.6N \times 150m = 88290 N \cdot m = 88290 J$

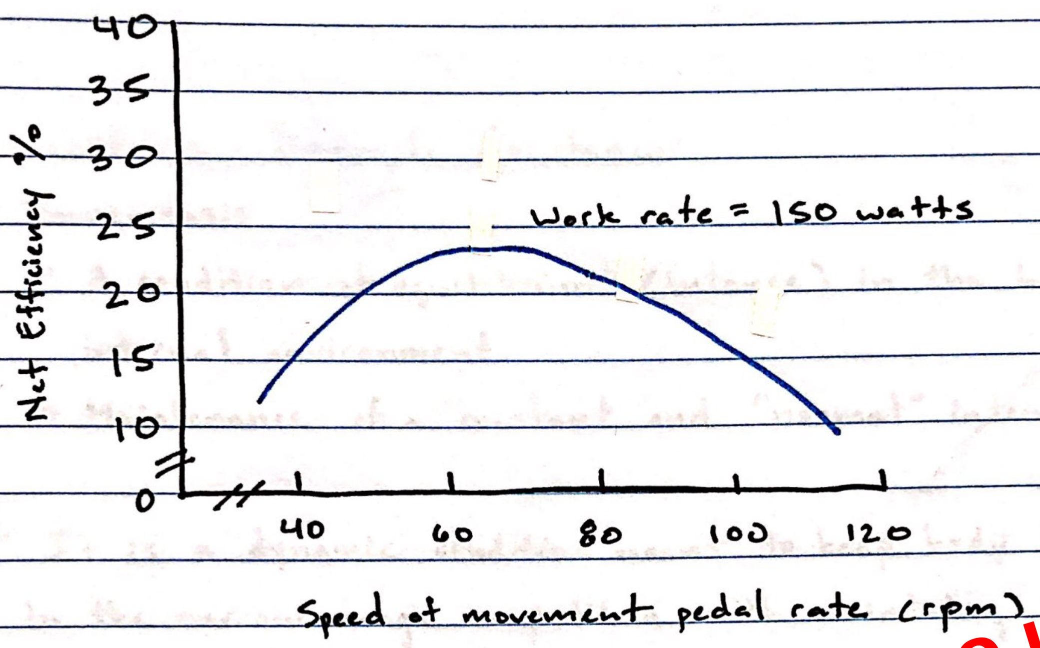
$60kg \times 0.075 \times 200 m \cdot min^{-1} \times 10 min = 9000 kgm$

Relationship Between Work Rate and $\dot{V}O_2$ for Cycling



The relationship between work rate and $\dot{V}O_2$ cost is linear for cycling over a wide range of workloads.

Effect of Speed of Movement of Net Efficiency



Running Economy

- Not possible to calculate net efficiency of horizontal running

- Running Economy
  → Oxygen cost of running at given speed
  → Lower VO_2 ($ml \cdot kg^{-1} \cdot min^{-1}$) at same speed indicates better running economy

- Gender difference
  → No difference at slow speeds
  → At "race pace" speeds, males may be more economical that females