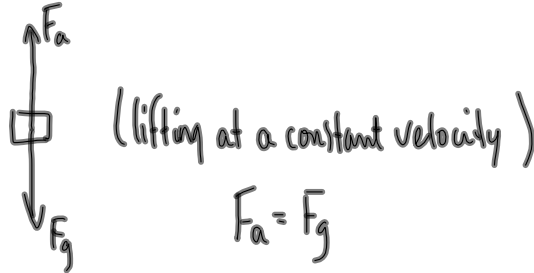


Work

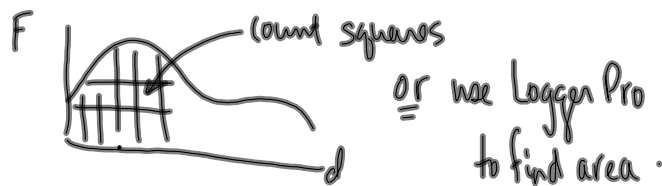
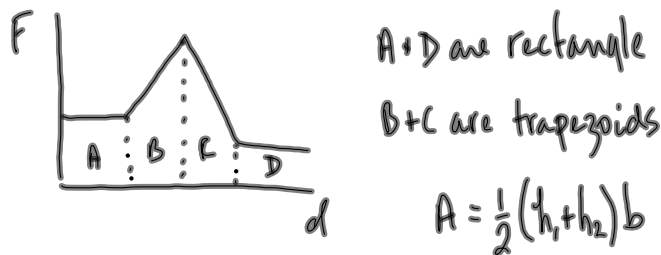
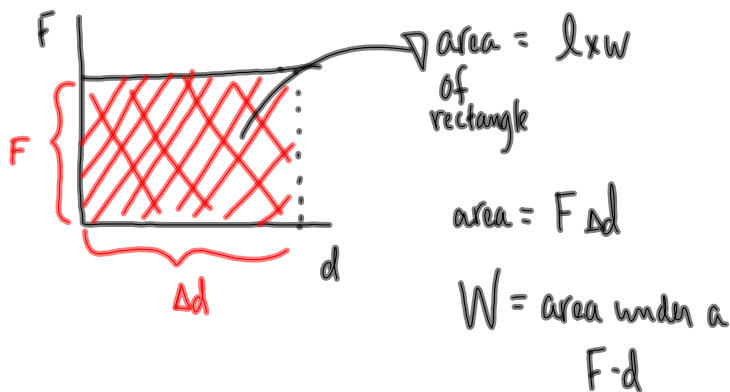
- transfer of energy to an object

$$W = F_{||} \Delta d \quad (F_{||} \text{ is in the same direction as the displacement})$$

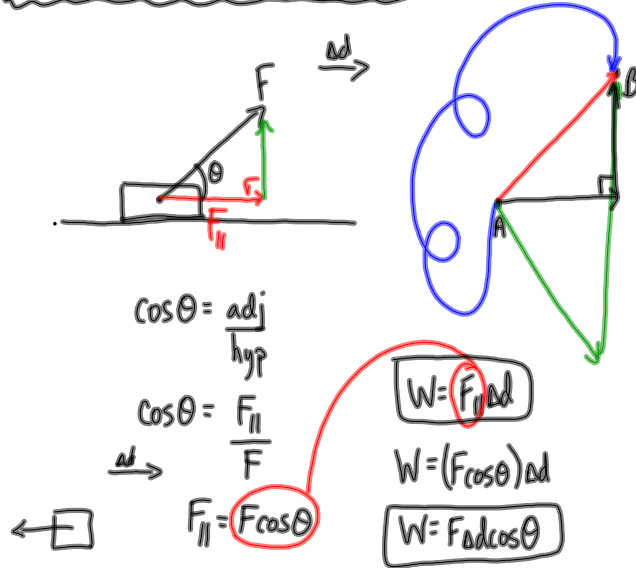
Note about lifting objects:



Consider a graph of  $F$  vs  $d$ :



What to do when F is not in the same direction as the displacement?



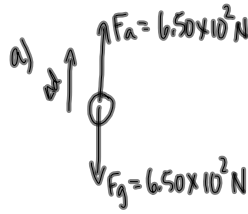
Maximum work when  $\theta = 0^\circ$  (F is in the same dir as ad)  
 If  $\theta = 180^\circ$  (if  $F_{\parallel}$  is action on an object), there will be negative work  
 If  $\theta = 90^\circ$ , no work!

$0 \leq \theta < 90^\circ \Rightarrow$  Positive work  
 $90^\circ < \theta \leq 180^\circ \Rightarrow$  Negative work

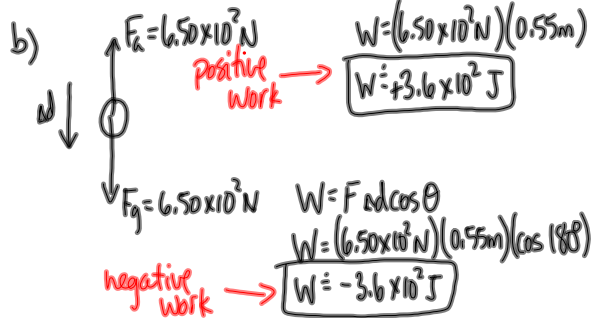
MP|233

$F_g = 6.50 \times 10^2 \text{ N}$   
 $\Delta d = 0.55 \text{ m}$

- a)  $W = ?$  (lifting)
- b)  $W = ?$  (lowering)



$W = F_{\parallel} \Delta d$   
 $W = (6.50 \times 10^2 \text{ N})(0.55 \text{ m})$   
 $W = +3.6 \times 10^2 \text{ J}$



- ① PP|225
- ② Look over MP|227 + PP|229
- ③ PP|235

