Question 2 grading sheet - Problem II

- Power = ~~work~~ force × velocity
  $= mg \times V$

15 - time = $\frac{\text{distance}}{\text{velocity}} = \frac{\text{distance}}{P/mg}$

- power = $\frac{\text{work}}{\text{cycle}} \times \frac{\text{cycles}}{\text{sec}}$

10 - 4 stroke engine @ 5000 RPM

$\frac{\text{cycles}}{\text{sec}} = \frac{5000 \text{ rev}}{\text{min}} \times \frac{\text{min}}{60 \text{ s}} \times \frac{\text{cycle}}{2 \text{ rev}}$ (5) (5)

10 - for an SI engine: otto cycle is ideal representation

10 $\frac{\text{work}}{\text{cycle}} = \eta {}_2Q_3 = \left(1 - \frac{1}{r^{k-1}}\right) {}_2Q_3$

${}_2Q_3 = mC_v (T_3 - T_2)$

5 - $m = \frac{P_1 V_1}{R T_1}$

5 - $V_1 = V_d + V_2 = V_d + \frac{V_1}{r} \Rightarrow V_1 = \frac{V_d}{(1 - 1/r)}$

5 - $T_2 = T_1 r^{k-1}$