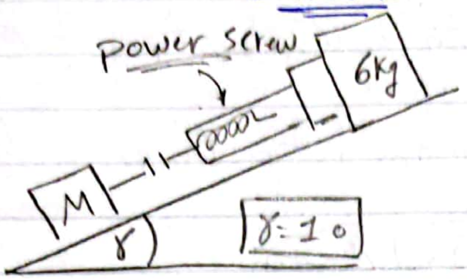
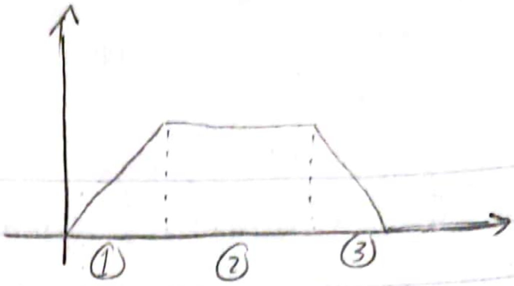
Section — Sheet 2

1





① $t_{rise} = \frac{1}{6} * 0.2 = s$

② $t_{const} = \frac{2}{3} * 0.2 = s$

③ $t_{fall} = \frac{1}{6} * 0.2 = s$

④ $t_{dwel} = 0.1 s$

$\Sigma T = I\alpha$ → لتحول أي Force لـ Torque

$\eta \, K.E_{in} = K.E_{out}$

$\eta \frac{1}{2} I \omega^2 = \frac{1}{2} m v^2$

$J_{eff} = m \frac{v^2}{\omega^2} * \frac{1}{\eta}$

pitch $= \frac{1}{2} \frac{rev}{mm}$

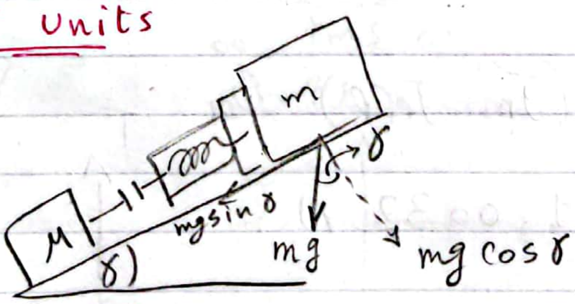
هي بالمللي دي عكسه

بيقولك : $\frac{mm}{rev}$

$I_{eff} = m \frac{1}{(2\pi P)^2} \frac{1}{\eta}$

عشان نحولها ~~revolute~~ rad لازم

SI units



① $6 * 9.8 * \cos(10) * \mu = $ friction

↳ $T = \frac{Friction}{\eta} * \frac{1}{2\pi P}$

② $6 * 9.8 * \sin(10) = $ weight

↳ $T = \frac{weight}{\eta} * \frac{1}{2\pi p}$

③ inertia of power screw

↳ $V = \pi r^2 h \Rightarrow m = \rho_{st} V$

$I_{powerscrew} = \frac{1}{2} m r^2$

Scanned with CamScanner

④ $I_{motor} = \frac{1}{4} I_{ps}$

$\Sigma T = I\alpha$

$T_m - T_W - T_F = [I_{motor} + I_{ps} + I_{eff}]\,\alpha$

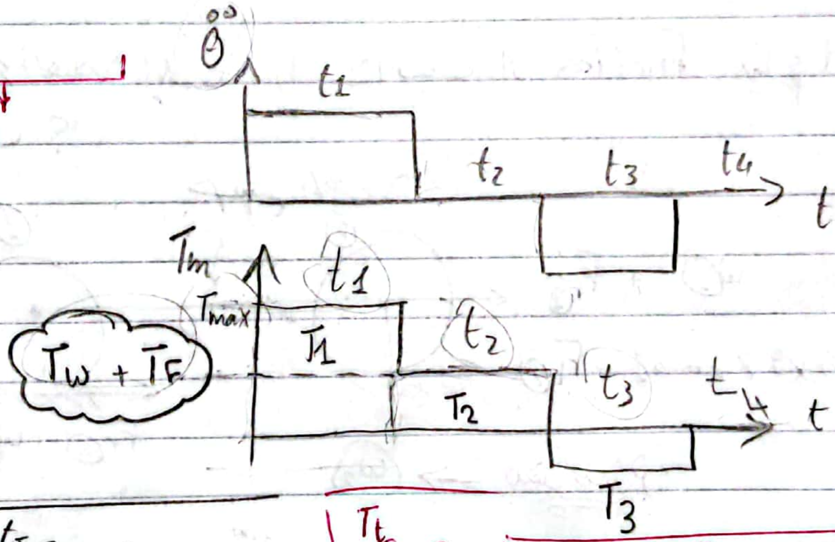
$\frac{V^2}{\omega^2}$ or $\frac{V}{\omega}$ ولما اشتغل بالعجلة

to get α

$\delta * \boxed{P * 2\pi} = \frac{1}{2}\dot{\theta} t_1 + \dot{\theta} t_2 + \frac{1}{2}\dot{\theta} t_3$

linear → rad

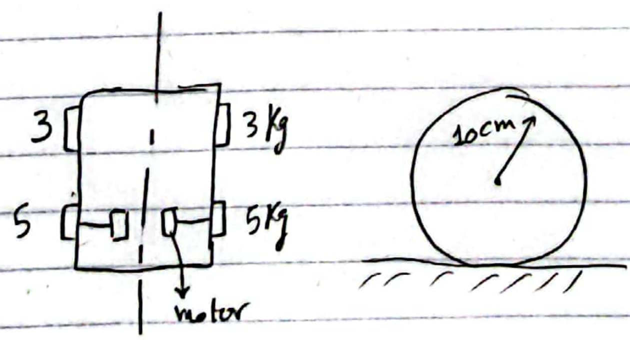
$* \ \ddot{\theta} = \frac{\dot{\theta}}{t}$



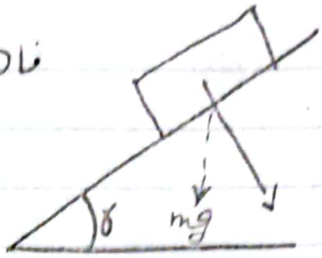
$T_{rms} = \sqrt{\frac{1}{t_T} \int_0^{t_T} \bar{T}_m^2 \, dt} \rightarrow \sqrt{\frac{\int_0^{T_t} \bar{T}_m^2}{t_T}} = \sqrt{\frac{\bar{T}_1^2 t_1 + \bar{T}_2^2 t_2 + \bar{T}_3^2 t_3}{t_T}}$

$t_T = t_1 + t_2 + t_3 + t_4$

[2]



نصف وزن العربية = 8Kg و إحنا هانشتغل على نصف العربية اليمين
عشان احنا عايزين نعمل motor selection
فاهنشتغل على نصف واحد بس وده
بالـ اللي فوق مش زي اللي
تحت



$\Sigma F = ma$

$F - 8\times 9.8\times \cos(2)\times 0.01 - (8\times 9.8\times \sin(2)) = 8\times\left(\frac{0.5}{1}\right)$

$F = 7.52\ N$ $\qquad T = F\times r = \ N.m$ ✓✓

* الـ Friction بتاع العجلة اللي ورا شايف الـ Friction بتاع العجل اللي قدام ازاي ؟!