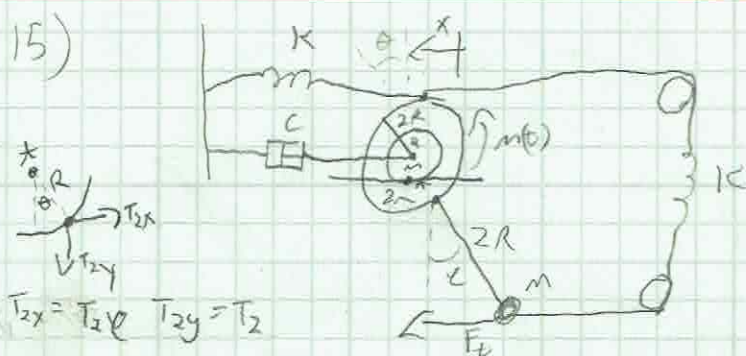


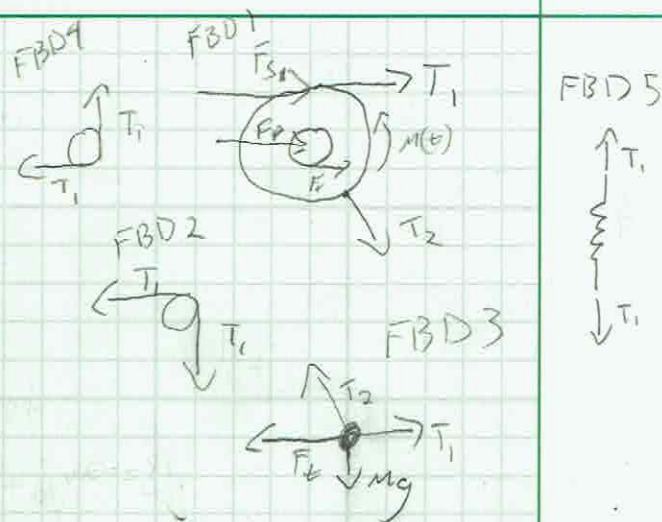
15)



$$T_{2x} = T_2 \ell \quad T_{2y} = T_2$$

$$X_2 = X_1 - 2R\theta - 2R\ell \quad X_1 = R\theta$$

$$y_2 = 2R$$



FBD 1

$$\leftarrow \sum F_x = m\ddot{X}_1 = -F_{S1} - T_1 - F_D - F_A - T_2 \ell$$

$$\curvearrowright \sum M_A = M(t) - F_D(R) - F_{S1}(3R) - F_{S2}(3R) - T_2 R\theta + T_2 \ell R = I_A \ddot{\theta}$$

FBD 5

$$T_1 = F_{S2}$$

$$\text{FBD 3 } \uparrow \sum F_y = m\ddot{y} = 0 = T_2 - mg$$

$$T_2 = mg$$

$$\leftarrow \sum F_x = F(t) + T_2 \ell - T_1 = m\ddot{X}_2$$

$$F(t) + mg\ell - F_{S2} = m(-\ddot{X}_1 - 2R\ddot{\ell})$$