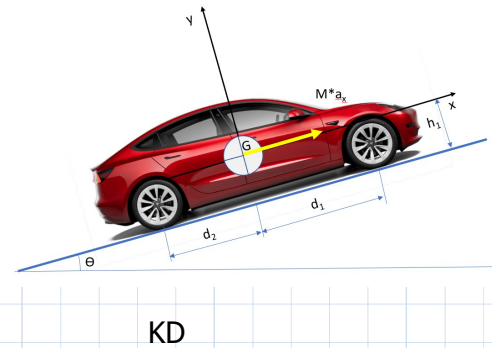
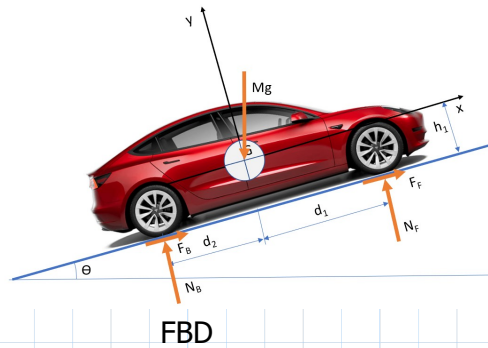


OPGAVE 2

Data:

$$\mu_S := 0.9 \quad M := 2265 \quad d_1 := 1.6 \quad d_2 := 1.275 \quad h_1 := 0.483 \quad g := 9.81 \quad \theta := 14.9999$$

a) FBD og KD:



b) Bevægelsesligninger - firehjulstræk:

$$F_F + F_B - M \cdot g \cdot \sin(\theta \cdot \text{deg}) = M \cdot a_x$$

$$N_F + N_B - M \cdot g \cdot \cos(\theta \cdot \text{deg}) = M \cdot a_y = 0$$

$$-N_B \cdot d_2 + N_F \cdot d_1 + (F_F + F_B) \cdot h_1 = I_G \cdot \alpha = 0$$

c) Maksimale friktionskræfter ved maksimal acceleration - ren rulning - firehjulstræk:

$$F_F = \mu_S \cdot N_F$$

$$F_B = \mu_S \cdot N_B$$

d) Acceleration op ad bakkevej - firehjulstræk:

Guess Values	$a_x := 5$	$N_F := 1000$	$N_B := 1000$
	$F_F := 10$	$F_B := 10$	
Constraints	$F_F + F_B - M \cdot g \cdot \sin(\theta \cdot \text{deg}) = M \cdot a_x$ $N_F + N_B - M \cdot g \cdot \cos(\theta \cdot \text{deg}) = 0$ $-N_B \cdot d_2 + N_F \cdot d_1 + (F_F + F_B) \cdot h_1 = 0$ $F_F = \mu_S \cdot N_F$ $F_B = \mu_S \cdot N_B$		
	$\text{Find}(a_x, N_F, N_B, F_F, F_B) = \begin{bmatrix} 5.989 \\ 6.273 \cdot 10^3 \\ 1.519 \cdot 10^4 \\ 5.646 \cdot 10^3 \\ 1.367 \cdot 10^4 \end{bmatrix}$		
Solver			

$$a_x = 5.989 \frac{m}{s^2}$$

e) Acceleration ad vandret vej - baghjulstræk:

$$\theta := 0$$

Guess Values	$a_x := 5$
	$N_F := 1000 \quad N_B := 1000 \quad F_F := 10 \quad F_B := 10$
Constraints	$F_F + F_B - M \cdot g \cdot \sin(\theta \cdot \text{deg}) = M \cdot a_x$ $N_F + N_B - M \cdot g \cdot \cos(\theta \cdot \text{deg}) = 0$ $-N_B \cdot d_2 + N_F \cdot d_1 + (F_F + F_B) \cdot h_1 = 0$ $F_F = 0$ $F_B = \mu_S \cdot N_B$
	$\text{Find}(a_x, N_F, N_B, F_F, F_B) = \begin{bmatrix} 5.789 \\ 7.651 \cdot 10^3 \\ 1.457 \cdot 10^4 \\ -1.045 \cdot 10^{-26} \\ 1.311 \cdot 10^4 \end{bmatrix}$
Solver	

$$a_x = 5.789 \frac{m}{s^2}$$