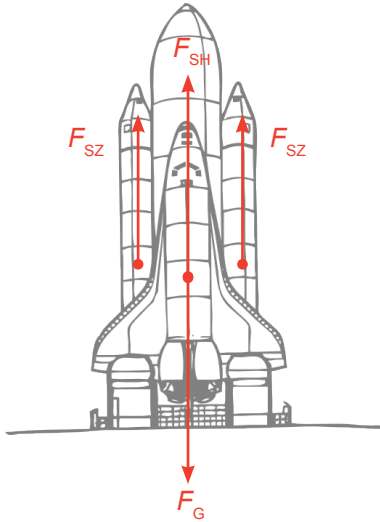


Lösungen/Solutions

1.



$$6. \quad F_S = F_a + F_L + F_R$$

$$F_S = m \cdot a + F_L + m \cdot g \cdot \mu$$

$$a = (F_S - F_L - m \cdot g \cdot \mu) : m$$

$$a = (2 \cdot 82'300 \text{ N} - 4000 \text{ N} - 50'300 \text{ kg} \cdot 9,81 \text{ m/s}^2 \cdot 0,05) : 50'300 \text{ kg}$$

$$a = \underline{\underline{2,702 \text{ m/s}^2}}$$

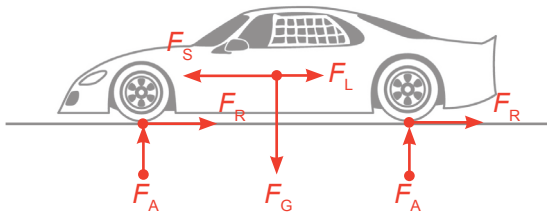
$$7. \quad F_{G1} - F_{G3} = F_{R2}$$

$$m_1 \cdot g - m_3 \cdot g = (m_2 + m_x) \cdot g \cdot \mu$$

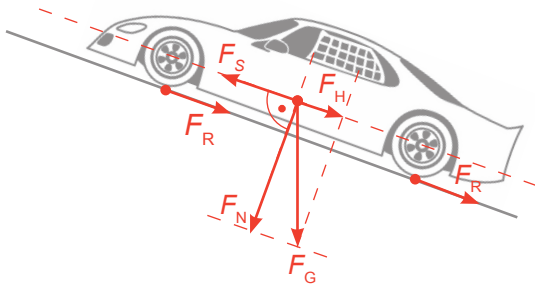
$$m_x = (m_1 - m_3 - m_2 \cdot \mu) : \mu$$

$$m_x = (28 \text{ kg} - 13 \text{ kg} - 4 \text{ kg} \cdot 0,1) : 0,1 = \underline{\underline{146 \text{ kg}}}$$

2.



3.



$$4a. \quad \mu = F_R : (m \cdot g \cdot \cos(\alpha))$$

$$\mu = 2498 \text{ N} : (980 \text{ kg} \cdot 9,81 \text{ m/s}^2 \cdot \cos(18^\circ)) = \underline{\underline{0,273}}$$

$$4b. \quad F_H = m \cdot g \cdot \sin(\alpha) = 980 \text{ kg} \cdot 9,81 \text{ m/s}^2 \cdot \sin(18^\circ)$$

$$F_H = \underline{\underline{2970,828 \text{ N}}}$$

$$5. \quad F_{G2} = F_{H1}$$

$$m_2 \cdot g = m_1 \cdot g \cdot \sin(\alpha)$$

$$\sin(\alpha) = m_2 \cdot g : m_1 \cdot g = 12 \text{ kg} : 18 \text{ kg} = 0,66$$

$$\sin^{-1}(\sin \alpha) = \sin^{-1}(0,66) = \underline{\underline{41,8^\circ}}$$