

Kap 2

Kraft

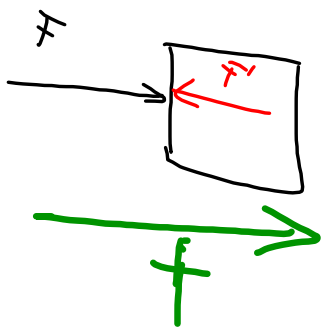
Symbol: F, G, T, R, K

Benevnelse: N



Newton's 3. lov:

Kraft = motkraft



$$\sum F = 0 \Rightarrow F + (-F') = 0$$

near $a = 0$

Newton's 1. lov:

$$\sum F = 0$$

near $a = 0 \Rightarrow$ Near $v = \text{konst}$

Newton's 2. lov

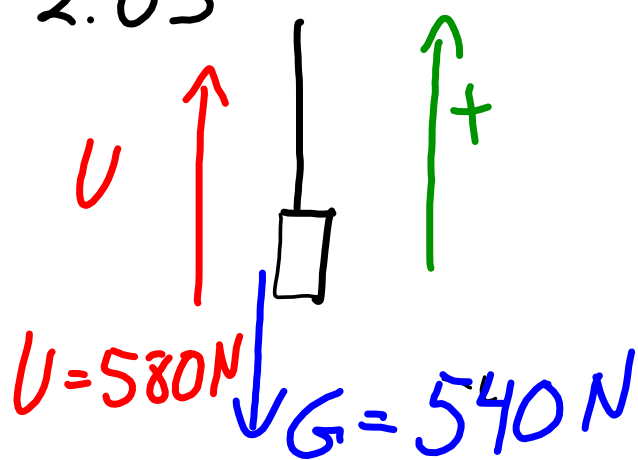
$$\sum F = m \cdot a$$

Tyngdekräften

$$G = m \cdot a = m \cdot g$$

- $9,81 \text{ m/s}^2$ \leftarrow på jorda

2.03



Bevegelse oppover

$$\sum F = U + G = 580 - 540 = 40 \text{ N}$$

2,07

$$a) \quad m = 4,0 \text{ kg}$$

$$g = 9,81 \text{ m/s}^2$$

$$G = m \cdot g = 4,0 \text{ [kg]} \cdot 9,81 \text{ [m/s}^2\text{]}$$

$$= 39,24 \text{ [kg} \cdot \text{m/s}^2\text{]} = 39,2 \text{ [N]}$$

$$b) \quad G = 29 \text{ [N]}$$

$$G = m \cdot g = 29 \text{ [N]}$$

$$m = \frac{29 \text{ [kg} \cdot \text{m/s}^2\text{]}}{9,81 \text{ [m/s}^2\text{]}} = 2,95 \text{ [kg]}$$

$$= 3 \text{ kg}$$

$$c) \quad \text{På månen: } g_m = 1,62 \text{ [m/s}^2\text{]}$$

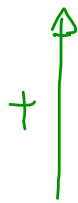
$$m = 30 \text{ [kg]}$$

$$G_m = m \cdot g_m = 30 \text{ [kg]} \cdot 1,62 \text{ [m/s}^2\text{]} = 48,6 \text{ [N]}$$

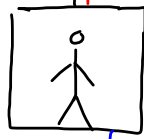
$$= 49 \text{ [N]}$$

2.13

a)



$$m = 70 \text{ kg}$$



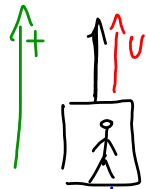
$$G = mg = 70 [\text{kg}] \cdot 9,81 [\text{m/s}^2] \\ = 687 [\text{kg} \cdot \text{m/s}^2] = 687 [\text{N}]$$

heisener i ro nedover

$$\sum F = ma = 0 = U + G$$

$$U = -G = -687 \text{ N} \\ = 687 \text{ N} \quad \textit{oppover}$$

b)



$$a = 2,5 \text{ m/s}^2$$

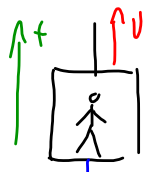
$$G = m \cdot g = 70 \cdot 9,81 [\text{N}] = 687 [\text{N}]$$

$$\sum F = m \cdot a = U + G$$

$$U = m \cdot a - G = 70 [\text{kg}] \cdot 2,5 [\text{m/s}^2] - 687 [\text{N}]$$

$$U = 175 [\text{N}] + 687 [\text{N}] = 862 [\text{N}] \quad \textit{oppover}$$

c)



$$a = 2,5 \text{ m/s}^2$$

$$G = mg = 687 [\text{N}]$$

$$\sum F = G + U = ma$$

$$U = ma - G = -70 \cdot 2,5 [\text{kg} \cdot \text{m/s}^2] - 687 [\text{N}]$$

$$U = -175 [\text{N}] + 687 [\text{N}] = 512 [\text{N}] \quad \textit{oppover}$$