VERKMENNTASKÓLINN Á AKUREYRI

3.4 Þyngdarkraftur

Bls. 24

3.4.1 $m = 2\,kg$

$a = g = 9{,}8\,m/s^2$

$F_{tog} = m \cdot g = 2kg \cdot 9{,}8\,m/s^2 = \underline{\underline{19{,}6\,N}}$

Þyngdarkraftur verkar niður $V = 0$

$F_{heild} = 0$ $\quad F_{heild} = F_g - F_{tog} = 0$

3.4.2

$m = 10{,}0\,kg$

$g = 9{,}8\,m/s^2$

a ?

Þyngdarkraftur $F_g = m \cdot g = 98\,N$ ↓ $F_g = 98N$

a) $F_{tog} = 110\,N$

↑ $F_{tog} = 110\,N$

↓ $F_g = 98\,N$

$F = m \cdot a$ $\quad F_{tog} - F_g = m \cdot a$

$110N - 98N = 10kg \cdot a$

$a = \frac{12N}{10kg} = \underline{\underline{1{,}2\,m/s^2 \text{ upp}}}$

b) $F_{tog} = 90\,N$

$F_{tog} - F_g = m \cdot a$

$90N - 98N = 10kg \cdot a$

$-8N = 10kg \cdot a$

$a = \frac{-8N}{10kg} = -0{,}8\,m/s^2$ niður

Svar: Hröðunin er $\underline{\underline{0{,}8\,m/s^2}}$

3.4.3

$a = 0{,}500\,m/s^2$

F_{tog} ?

$m = 10{,}0\,kg$

$g = 9{,}8\,m/s^2$

$F_g = 98N$

hröðun upp. F_{tog}?

↑ F_{tog}

↓ F_g

Þá er $F_{tog} > F_g$

$F_{tog} - F_g = m \cdot a$

$F_{tog} = 98\,N + 10kg \cdot 0{,}5\,m/s$

$= 98\,N + 5\,N$

$= 103\,N$

3.4.4.

$m = 10{,}0\ kg$

$a_{niður} = 2{,}0\ m/s^2$

F_{tog} ?

$m \cdot g > F_{tog}$

$F_{niður} - F_{tog} = m \cdot a$

$10kg \cdot 9{,}8 m/s^2 - F_{tog} = 10kg \cdot 2 m/s^2$

$98\,N - 20\,N = F_{tog}$

$F_{tog} = 78\,N$