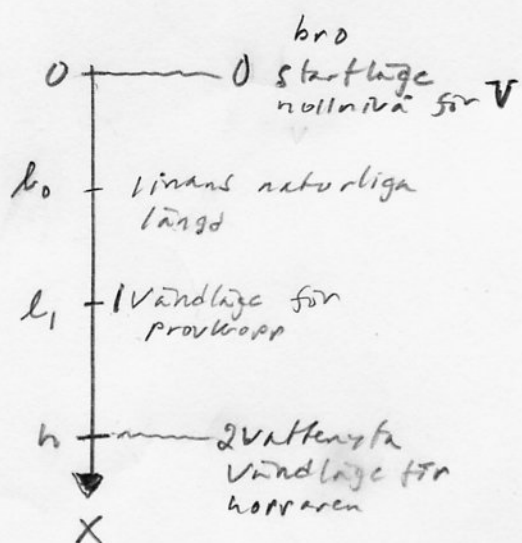


9.1



Tyngdkraften och fjäderkraften är konservativa.

Mekaniska energilagen gäller

Stenen (ger K)

$$T_1 + V_1 = T_0 + V_0$$

$$T_1 = 0 \quad T_0 = 0 \quad V_0 = 0$$

$$V_1 = -mg l_1 + \frac{1}{2} K (l_1 - l_0)^2$$

$$-mg l_1 + \frac{1}{2} K (l_1 - l_0)^2 = 0$$

$$K = \frac{2mg l_1}{(l_1 - l_0)^2} \quad (1)$$

Hopparen

$$T_2 + V_2 = T_0 + V_0$$

$$T_0 = 0 \quad T_2 = 0 \quad V_0 = 0$$

$$V_2 = -m_{\max} g h + \frac{1}{2} K (h - l_0)^2$$

$$-m_{\max} g h + \frac{1}{2} K (h - l_0)^2 = 0$$

Ins av (1) ger

$$m_{\max} g h = \frac{1}{2} \frac{2mg l_1}{(l_1 - l_0)^2} (h - l_0)^2$$

$$m_{\max} = \frac{l_1 (h - l_0)^2}{h (l_1 - l_0)^2} m_1$$

$$l_0 = \frac{h}{2} \quad l_1 = \frac{3}{4} h \quad m_1 = 50 \text{ kg}$$

$$m_{\max} = \frac{3h}{4h} \frac{(h - \frac{h}{2})^2}{(\frac{3}{4}h - \frac{h}{2})^2} m_1 = \frac{3}{4} \frac{h^2/4}{h^2/16} m_1 =$$

$$= 3m_1 = 3 \cdot 50 \text{ kg} = \underline{150 \text{ kg}}$$

GK