

Ballistisches Pendel

Diabolo 4.5mm

$$m_D := 0.52 \text{ gm}$$

.45 ACP

$$m_{ACP} := 12 \text{ gm}$$

7.62 x 51 NATO

$$m_{762} := 10 \text{ gm}$$

Masse Holzklotz

$$m_{K1} := 0.1 \text{ kg}$$

$$m_{K2} := 10 \text{ kg}$$

Pendellänge

$$l_P := 1 \text{ m}$$

Erdbeschleunigung

$$g = 9.807 \frac{\text{m}}{\text{s}^2}$$

gemessene Auslenkung

$$\varphi := 15 \text{ deg}$$

Geschossmassen

$$m_{G1} := m_D$$

$$m_{G2} := m_{762}$$

Geschwindigkeiten

$$v_{G1} := \left(\frac{m_{K1}}{m_{G1}} + 1 \right) \cdot \sqrt{2 \cdot g \cdot l_P \cdot (1 - \cos(\varphi))} = 158.029 \frac{\text{m}}{\text{s}}$$

$$v_{G2} := \left(\frac{m_{K2}}{m_{G2}} + 1 \right) \cdot \sqrt{2 \cdot g \cdot l_P \cdot (1 - \cos(\varphi))} = 818.318 \frac{\text{m}}{\text{s}}$$

Geschossenergie

$$E_1 := \frac{m_{G1}}{2} \cdot v_{G1}^2 = 6.493 \text{ J}$$

$$E_2 := \frac{m_{G2}}{2} \cdot v_{G2}^2 = 3348.221 \text{ J}$$

Formänderungsarbeit

$$W_{F1} := \frac{1}{2} \cdot \frac{m_{G1} \cdot m_{K1}}{m_{G1} + m_{K1}} \cdot v_{G1}^2 = 6.459 \text{ J}$$

$$W_{F2} := \frac{1}{2} \cdot \frac{m_{G2} \cdot m_{K2}}{m_{G2} + m_{K2}} \cdot v_{G2}^2 = (3.345 \cdot 10^3) \text{ J}$$

potentielle Energie

$$U_1 := E_1 - W_{F1} = 0.034 \text{ J}$$

$$U_2 := E_2 - W_{F2} = 3.345 \text{ J}$$

$$U_{P1} := \frac{E_1 - W_{F1}}{W_{F1}} \cdot 100 = 0.52$$

$$U_{P2} := \frac{E_2 - W_{F2}}{W_{F2}} \cdot 100 = 0.1$$