

$$1. \quad 30 \text{ km/h} = 8,3 \frac{\text{m}}{\text{s}}$$

$$E_{\text{pot}} = E_{\text{kin}}$$

$$m \cdot g \cdot \Delta h = \frac{1}{2} m \cdot v^2 \quad | : m$$

$$\Delta h = \frac{v^2}{2 \cdot g} = 3,54 \text{ m}$$

$$2. \quad W = F \cdot s = 150 \text{ N} \cdot 3 \text{ m} = 450 \text{ Nm}$$

$$3. \quad m_H = 50 \text{ kg}, \quad m_F = 12 \text{ kg}, \quad v = 18 \frac{\text{km}}{\text{h}} = 5 \frac{\text{m}}{\text{s}}$$

$$s = 45 \text{ m}$$

$$a) \quad W = F \cdot s = \frac{1}{2} m v^2 \\ = \frac{1}{2} 62 \text{ kg} \cdot 25 \frac{\text{m}^2}{\text{s}^2} = 775 \text{ Nm}$$

$$b) \quad F = \frac{W}{s} = \frac{775 \text{ Nm}}{45 \text{ m}} = 17,2 \text{ N}$$

$$4. \quad m = 1200 \text{ kg}, \quad v_1 = 80 \frac{\text{km}}{\text{h}} = 22,2 \frac{\text{m}}{\text{s}}$$

$$v_2 = 100 \frac{\text{km}}{\text{h}} = 27,7 \frac{\text{m}}{\text{s}}$$

$$\Delta v = 5,56 \frac{\text{m}}{\text{s}}$$

$$a) \quad E_{\text{kin}} = \frac{1}{2} m v_2^2 = 460374 \text{ J} = 460 \text{ kJ}$$

$$b) \quad E_{\text{kin}}(v_1) = \frac{1}{2} m v_1^2 = 295704 \text{ J} = 296 \text{ kJ}$$

$$\Delta E = 460374 \text{ J} - 295704 \text{ J} = 164670 \text{ J}$$

$$\Delta E \approx 165 \text{ kJ}$$

5. 490 kJ. Energie, die dem Körper in Form von innerer Energie empfunden wird.

$$m = 50 \text{ kg}$$

$$m \cdot g \cdot \Delta h = 490000 \text{ J}$$

$$\Delta h = \frac{490000 \text{ J}}{50 \text{ kg} \cdot 9,81} = 1000 \text{ m}$$

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