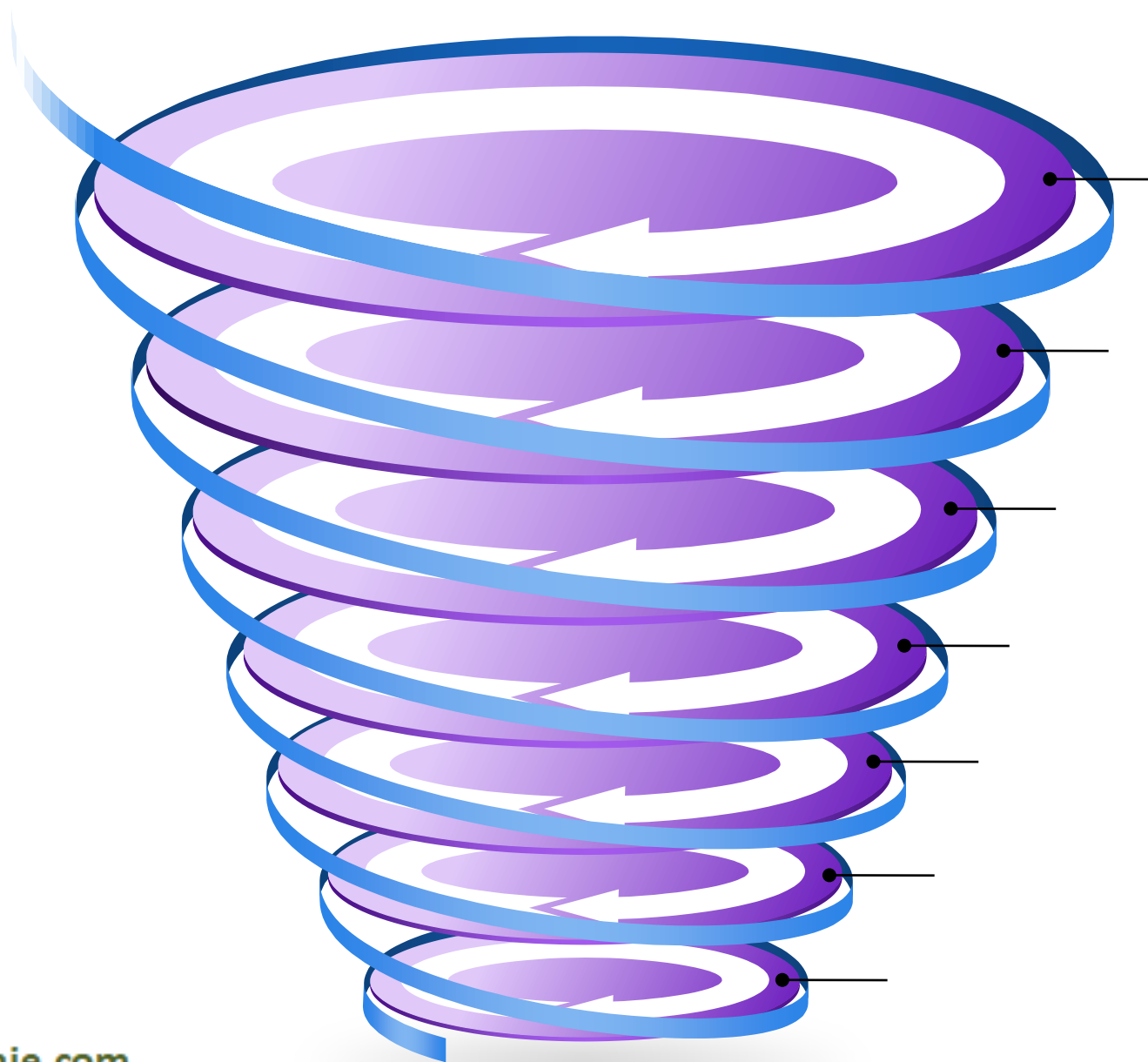


KINETIČKA ENERGIJA - zadaci



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KINETIČKA ENERGIJA zadaci

1. Kolikom kinetičkom energijom raspolaže ptica mase 100g kada leti brzinom $54 \frac{km}{h}$?

$$m = 100 \text{ g} = 0,1 \text{ kg}$$

$$v = 54 \frac{km}{h} = 54 \frac{1000m}{3600s} = 15 \frac{m}{s}$$

$$E_k = ?$$

$$E_k = \frac{m \cdot v^2}{2}$$

$$E_k = \frac{0,1kg \cdot (15 \frac{m}{s})^2}{2}$$

$$E_k = \frac{0,1kg \cdot 225(\frac{m}{s})^2}{2}$$

$$E_k = 11,25J$$

2. Kolikom brzinom se kreće autompbil mase 1,8 t ako je njegova kinetička energija 360 kJ?

$$m = 1,8t = 1800 \text{ kg}$$

$$E_k = 360 \text{ kJ} = 360\,000 \text{ J}$$

$$v = ?$$

$$E_k = \frac{m \cdot v^2}{2}$$

$$2 \cdot E_k = m \cdot v^2$$

$$\frac{2 \cdot E_k}{m} = v^2$$

$$\sqrt{\frac{2 \cdot E_k}{m}} = v$$

$$v = \sqrt{\frac{2 \cdot E_k}{m}}$$

$$v = \sqrt{\frac{2 \cdot E_k}{m}}$$

$$v = \sqrt{\frac{2 \cdot 360\,000 \text{ J}}{1800 \text{ kg}}}$$

$$v = \sqrt{400 \frac{\text{J}}{\text{kg}}}$$

$$v = 20 \frac{\text{m}}{\text{s}}$$

3. Kamen mase 5 kg slobodno pada. Koliku kinetičku energiju ima kamen nakon 3 s?

$$m = 5kg$$

$$v = g \cdot t$$

$$E_k = \frac{m \cdot v^2}{2}$$

$$t = 3s$$

$$v = 10 \frac{m}{s^2} \cdot 3s$$

$$E_k = \frac{5kg \cdot (30 \frac{m}{s})^2}{2}$$

$$E_k = ?$$

$$v = 30 \frac{m}{s}$$

$$E_k = \frac{5kg \cdot 900 (\frac{m}{s})^2}{2}$$

$$E_k = 2250J$$

4. Loptica mase 200g bačena je vertikalno naviše brzinom $20\frac{m}{s}$. Koliku kinetičku energiju ima nakon 0,5s?

$$m = 200g = 0,2kg$$

$$v_0 = 20\frac{m}{s}$$

$$t = 0,5s$$

$$E_k = ?$$

$$v = v_0 - g \cdot t$$

$$v = 20\frac{m}{s} - 10\frac{m}{s^2} \cdot 0,5s$$

$$v = 20\frac{m}{s} - 5\frac{m}{s}$$

$$v = 15\frac{m}{s}$$

$$E_k = \frac{m \cdot v^2}{2}$$

$$E_k = \frac{0,2kg \cdot (15\frac{m}{s})^2}{2}$$

$$E_k = \frac{0,2kg \cdot 225(\frac{m}{s})^2}{2}$$

$$E_k = 22,5J$$

5. Kolika je masa tela koje pri brzini $10 \frac{m}{s}$ ima kinetičku energiju 150J?

$$v = 10 \frac{m}{s}$$

$$E_k = 150J$$

$$m = ?$$

$$E_k = \frac{m \cdot v^2}{2}$$

$$2 \cdot E_k = m \cdot v^2$$

$$\frac{2 \cdot E_k}{v^2} = m$$

$$m = \frac{2 \cdot E_k}{v^2}$$

$$m = \frac{2 \cdot E_k}{v^2}$$

$$m = \frac{2 \cdot 150J}{(10 \frac{m}{s})^2}$$

$$m = \frac{300J}{100(\frac{m}{s})^2}$$

$$m = 3kg$$