



$$x_1 = v_1 \cos \alpha t$$

$$x_2 = v_2 \cos \beta t$$

$$y_1 = v_1 \sin \alpha t - \frac{gt^2}{2}$$

$$y_2 = v_2 \sin \beta t - \frac{gt^2}{2}$$

$$S = \sqrt{(x_1 + x_2)^2 - (y_2 - y_1)^2} = \sqrt{(v_1 \cos \alpha t + v_2 \cos \beta t)^2 - (v_2 \sin \beta t - \frac{gt^2}{2} - v_1 \sin \alpha t + \frac{gt^2}{2})^2} =$$

$$= \sqrt{(\cos^2 t) \cdot (v_1 + v_2)^2 + (\sin^2 t) \cdot (v_2 - v_1)^2} = t \sqrt{\cos^2 \alpha (v_1 + v_2)^2 + \sin^2 \alpha (v_2 - v_1)^2}$$

$$= t \sqrt{\cos^2 \alpha \cdot v_1^2 + 2v_1 v_2 \cos^2 \alpha + v_2^2 \cos^2 \alpha + \sin^2 \alpha v_2^2 - 2v_1 v_2 \sin^2 \alpha + v_1^2 \sin^2 \alpha} =$$

$$= t \sqrt{v_1^2 + v_2^2 + 2v_1 v_2 (\cos^2 \alpha - \sin^2 \alpha)} = t \sqrt{v_1^2 + v_2^2 + 2v_1 v_2 \cos 2\alpha} =$$

$$t \sqrt{5^2 + 6^2 + (600 + 2 \cdot 24 \cdot 400,5)} = 1,5 \cdot 56 = 84 \text{ м.}$$

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N4

$$F_1 = k \frac{q_1^1}{r_1}$$

$$F_2 = k \frac{q_2^1}{r_2}$$

$$q_1^1 + q_2^1 = q_1 + q_2$$

$$q = q_1 + q_2 = 14 \cdot 10^{-9} + (-7 \cdot 10^{-9}) = 14 \cdot 10^{-9} - 7 \cdot 10^{-9} = 7 \cdot 10^{-9} \text{ Кл}$$

$$q_1^1 = \frac{(q_1 + q_2) r_2}{r_1 + r_2} = 5 \text{ нКл}$$

84

N3

$$T_3 = T$$

$$T_2 = 2T \quad (l = 4)$$

$$T_1 = l^2 T$$

менші

$$\Delta U_{3-1} = 0,5 \sqrt{R} (T - T_3)$$

$$\Delta U_{3-1} = 1,5 \sqrt{R} (T_1 - T_3)$$

$$Q_{3-1} = \Delta U_{3-1} + \Delta t_{3-1} = 2 \sqrt{R} (T_1 - T_3) = 2 \sqrt{R} T (l^2 - 1)$$

$$\Delta t = \Delta t_{3-1} + \Delta t_{2-3} = 0,5 \sqrt{R} (T_1 - T_3) + \sqrt{R} (T_3 - T_2) = 0,5 \sqrt{R} T (l^2 - 1)^2$$

$$Q = \frac{\Delta t}{Q} = \frac{2-1}{4(l^2+1)} = 0,15 \cdot 100\% = 15\%$$

84

Барлығы: 184