

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

$x_2 = v_2 \cos \beta t$

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

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

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

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

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

$2v_1 v_2 \cos^2 \alpha = t \cdot \sqrt{576 + 600 + 2 \cdot 24 \cdot \cos 95} = 1,5 \cdot 56 = 84 \mu$

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4. $F_1 = k \frac{q_1^1}{r_1^2}$

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

$q = q_1 + q_2 = 14 \cdot 10^{-9} + (7 \cdot 10^{-9}) = 21 \cdot 10^{-9} - 7 \cdot 10^{-9} = 14 \cdot 10^{-9} \text{ Кл}$

$F_2 = k \frac{q^1}{r_2^2}$

$q_2^1 = \frac{(q + q_2)k}{r_1 + r_2} = 54 \text{ Кл}$

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3. $T_2 \leq T$

$T_2 = d \Delta T \quad (L=4)$

$T_1 = d^2 T$

III: $A_{3-1} = 0,5 \Delta R (T_1 - T_3)$

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

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

$A = A_{3-1} + A_{2-3} = 0,5 \Delta R (T_1 - T_3) + \Delta R (T_3 - T_2) = 0,5 \Delta R T (L-1)^2$

$q = \frac{A}{Q_{3-1}} = \frac{L-1}{4L+4} = 0,15 = 15\%$

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Барысхан: 19 ұлы