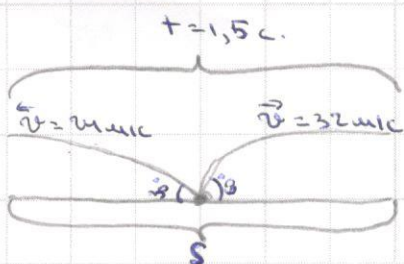


1)



$$v_1 = \frac{2v_0 \sin \alpha \cos \alpha}{g} = \frac{2 \cdot 24 \cdot \frac{1}{2} \cdot \frac{\sqrt{3}}{2}}{10} = \frac{12\sqrt{3}}{10}$$

$$v_2 = \frac{2v_0 \sin \alpha \cos \alpha}{g} = \frac{2 \cdot 32 \cdot \frac{1}{2} \cdot \frac{\sqrt{3}}{2}}{10} = \frac{16\sqrt{3}}{10}$$

$$x_1 = v_0 \sin \alpha t$$

$$x_2 = v_0 \cos \alpha t$$

$$y_1 = v_0 \sin \alpha t + \frac{gt^2}{2}$$

$$y_2 = -v_0 \cos \alpha t + \frac{gt^2}{2}$$

$$S = \sqrt{(x_1 + x_2)(y_2 - y_1)} = \sqrt{(v_0 \sin \alpha t + v_0 \cos \alpha t) + (v_0 \sin \alpha t + \frac{gt^2}{2} - v_0 \cos \alpha t + \frac{gt^2}{2})}$$

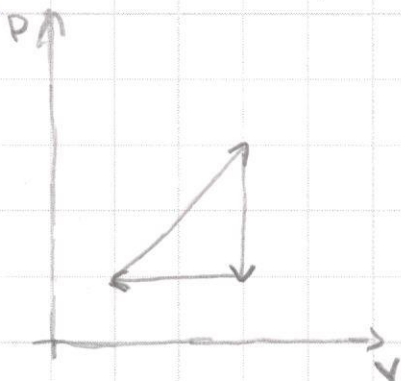
$$\sqrt{(v_0 \sin \alpha t + v_0 \cos \alpha t) + (v_0 \sin \alpha t - v_0 \cos \alpha t)} = \sqrt{t(v_0 \sin \alpha + v_0 \cos \alpha) + t(v_0 \sin \alpha - v_0 \cos \alpha)}$$

$$\sqrt{(v_0 \sin \alpha + v_0 \cos \alpha)^2} = \sqrt{t^2 + (v_0 \sin \alpha + v_0 \cos \alpha)^2} = t \sqrt{v_1^2 + v_2^2} =$$

$$t \sqrt{\left(\frac{12\sqrt{3}}{10}\right)^2 + \left(\frac{16\sqrt{3}}{10}\right)^2} = t \sqrt{\frac{432}{100} + \frac{768}{100}} = t \sqrt{\frac{1200}{100}} = t \sqrt{12}$$

$$S = t \sqrt{12} = 1,5 \cdot \sqrt{12} \approx 5 \text{ m}$$

2)



$$T_1 = T_2$$

$$T_2 = T_a$$

$$T_3 = T_1$$

$$a = 4$$

$$Q_{3-1} = u_{3-1} + A_{3-1} = 2OR(T_3 - T_1) = 2ORT(a-1)$$

$$A = A_{3-1} + A_{3-2} = 0,5OR(T_2 - T_1) = 0,5ORT(a^2 - 1)$$

$$\eta = \frac{A}{Q_{3-1}} = \frac{0,5ORT(a^2 - 1)}{2ORT(a-1)} = \frac{(a^2 - 1)}{4(a-1)} = \frac{15}{4 \cdot 8} = \frac{5}{4} = 0,8$$

$$\eta = 80\%$$

$$4) T = 2\pi \sqrt{\frac{e}{g_0}}$$

$$T = 2\pi \sqrt{\frac{e}{g_n}}$$

$$2\pi \sqrt{\frac{e}{g_0}} = 2\pi \sqrt{\frac{e}{g_n}}$$

$$e_0 = e_n$$

$$\sqrt{\frac{e}{g_0}} = \sqrt{\frac{e}{g_n}}$$

$$\sqrt{\frac{e}{9,78}} = \sqrt{\frac{e}{9,83}}$$

$$\frac{e}{3,13} = \frac{e_n}{3,14}$$

$$3,14 e_0 = 3,13 e_n$$

$$\frac{e_0}{e_n} = \frac{3,13}{3,14}$$

$$\frac{e_0}{e_n} = 0,99$$

я. Ол бір тәулікте 0,99 озан түреді.