

$$t_1 = \sqrt{\frac{2L_1}{g \sin \alpha}}; t_2 = \sqrt{\frac{2L_2}{g \sin \alpha}}$$

$$v_1 = \sqrt{2gs \sin \alpha \cdot L_1} ; v_2 = \sqrt{2gs \sin \alpha \cdot L_2}$$

$$t = t_1 + \frac{S}{v_1} = t_2 + \frac{S}{v_2} \Rightarrow S = \frac{(t_2 - t_1) v_1 \cdot v_2}{v_1 - v_2}$$

$$t = t_1 + \frac{(t_1 - t_2) \cdot \sqrt{2}}{\sqrt{1} - \sqrt{2}} = t_2 + \frac{(t_1 - t_2) \sqrt{1}}{\sqrt{1} - \sqrt{2}} = \frac{\sqrt{1} t_1 - \sqrt{2} t_2}{\sqrt{1} - \sqrt{2}}$$

Подставляя значения v_1, v_2 и t_1, t_2

$$t = \sqrt{\frac{2L_1}{g \sin \alpha}} + \sqrt{\frac{2L_2}{g \sin \alpha}} = t_1 + t_2.$$