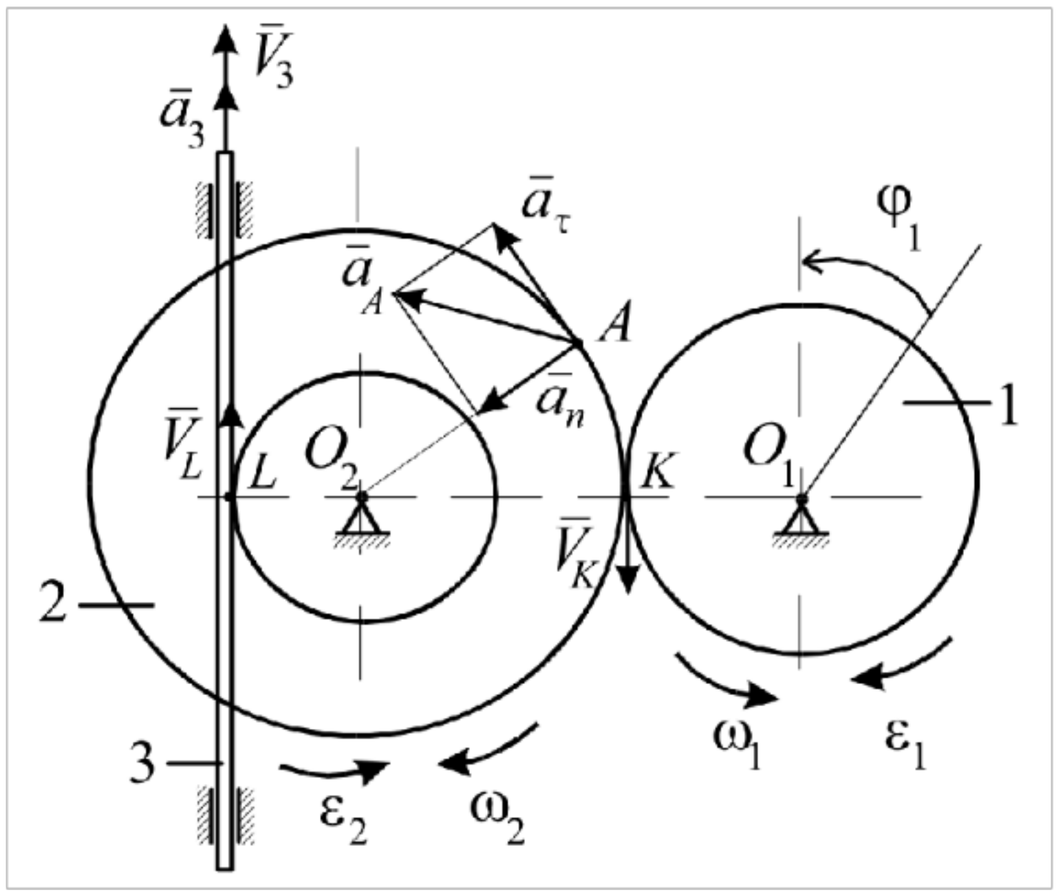
The mechanism contains 2 wheels: **1**, $R_1 = 4$ and **2**, $R_2 = 2$, $r_2 = 1$, which are connected with a toothed bar **3**. We also know the motion law of wheel 1. $\phi(t) = 4t - t^2$.

Tasks:

1. For $t_1 = 1$ find acc and vel for **3**;
2. Find all types of acc for point A.



Lab 2, task 3

(1) For finding $\bar{V}_3$ and $\bar{a}_3$ we have to find everything else, starting from actuator (wheel 1)

$\varphi_1(t) \Rightarrow \omega_1 = \dot{\varphi}_1 = 4 - 2t$

$\varepsilon_1 = \ddot{\varphi}_1 = -2$; $t_1 = 1 \Rightarrow \omega_1 = 2$

(2) Wheels 1 and 2 are connected without slippering. Hence:

$|\bar{V}_{K_1}| = |\bar{V}_{K_2}|$ $\quad \bar{V}_{K_1} \uparrow\downarrow \bar{V}_{K_2}$

$|\bar{V}_K| = \omega_1 R_1 = \omega_2 R_2 \Rightarrow \omega_2 = 2(4-2t)$; $t_1 \Rightarrow \omega_2 = 4$

$\varepsilon_2 = \dot{\omega}_2 = -4$

(3) Bar 3 connected with small wheel 2

$|V_3| = |V_L| = \omega_2 r_2 = 2(4-2t) \cdot 1$; $t_1 \Rightarrow V_3 = 4$

$a_3 = \dot{V}_3 = -4$

(4) Let's find accelerations for "A"

$\bar{a}_A = \bar{a}_{n_A} + \bar{a}_{\tau_A}$

$a_{n_A} = \omega_2^2 R_2 = 32$

$a_{\tau_A} = \varepsilon_2 R_2 = -8$

$\Rightarrow a_A = 33$

Directions are shown on the figure