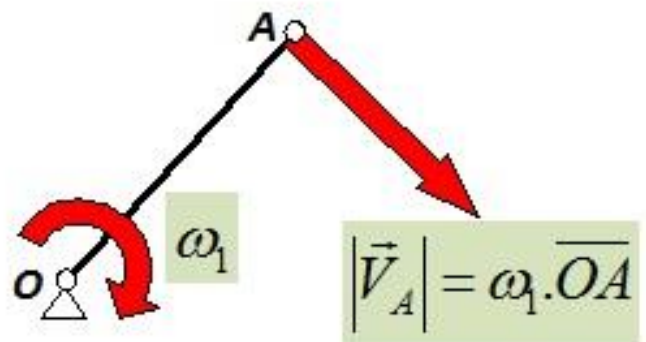
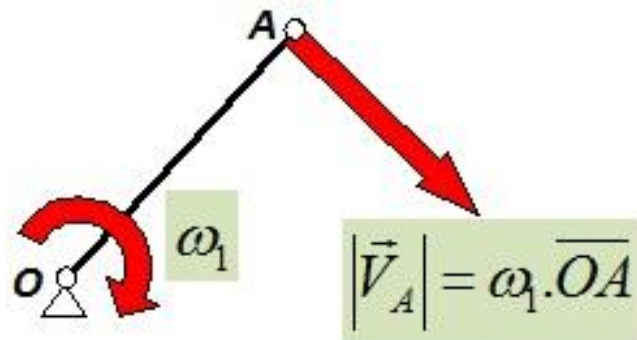


**Мотовилкови криви.
Скорости и ускорения
на основни
асурови групи**

1. Тип RRP

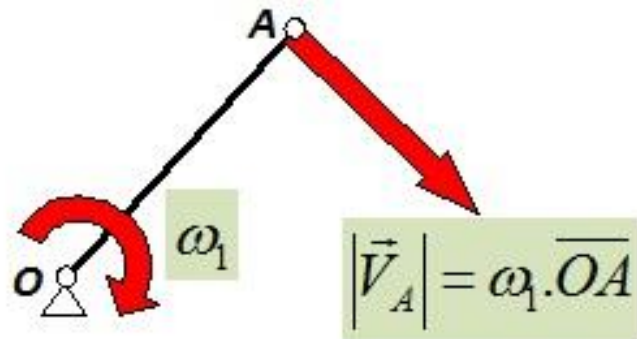


$$|\vec{V}_A| = \omega_1 \cdot \overline{OA} = 10 \text{ rad/s} \cdot 0,15 \text{ mm} = 1,5 \text{ m/s}$$

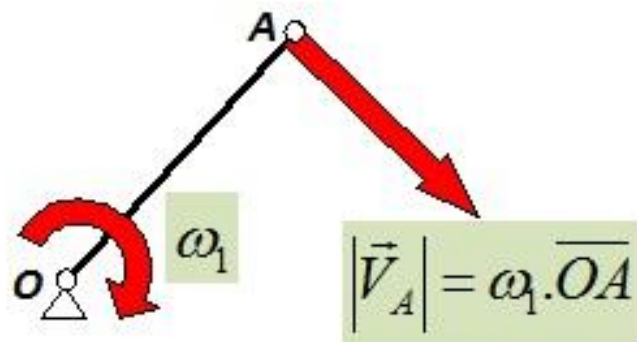


$$|\vec{V}_A| = \omega_1 \cdot \overline{OA} = 10 \text{ rad/s} \cdot 0,15 \text{ mm} = 1,5 \text{ m/s}$$

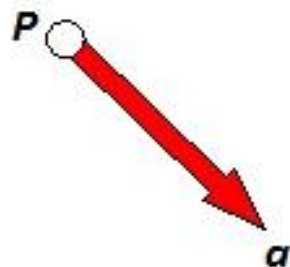
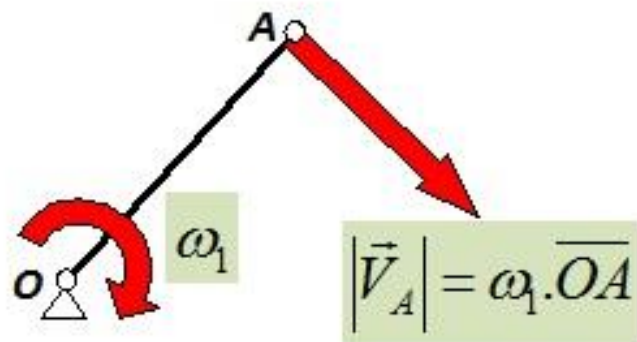
$$k_V = \frac{1 \text{ m/s}}{20 \text{ mm}} = 0,05 \frac{\text{m/s}}{\text{mm}} \Rightarrow \vec{V}_A = \frac{|\vec{V}_A|}{k_V}$$



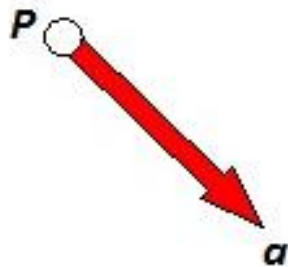
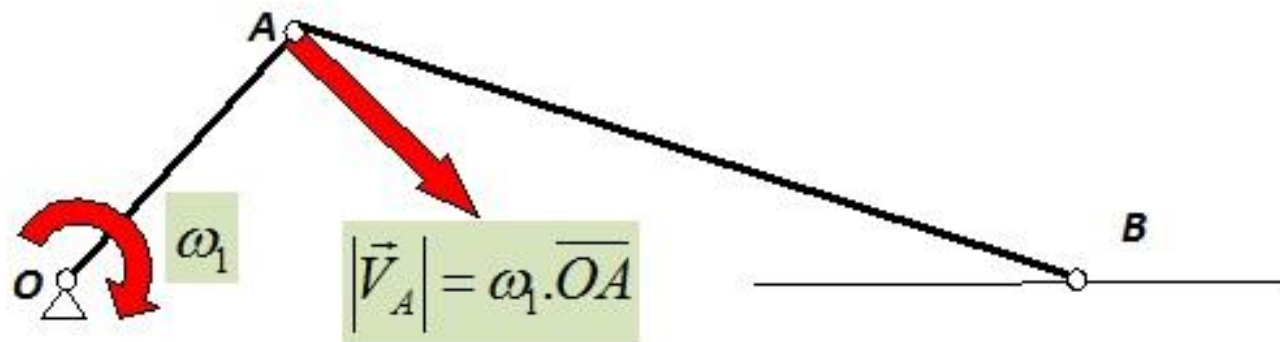
$$\bar{V}_A = \frac{|\vec{V}_A|}{k_V} = \frac{1,5}{0,05} = 30mm$$



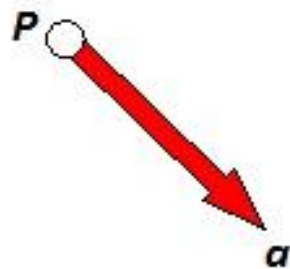
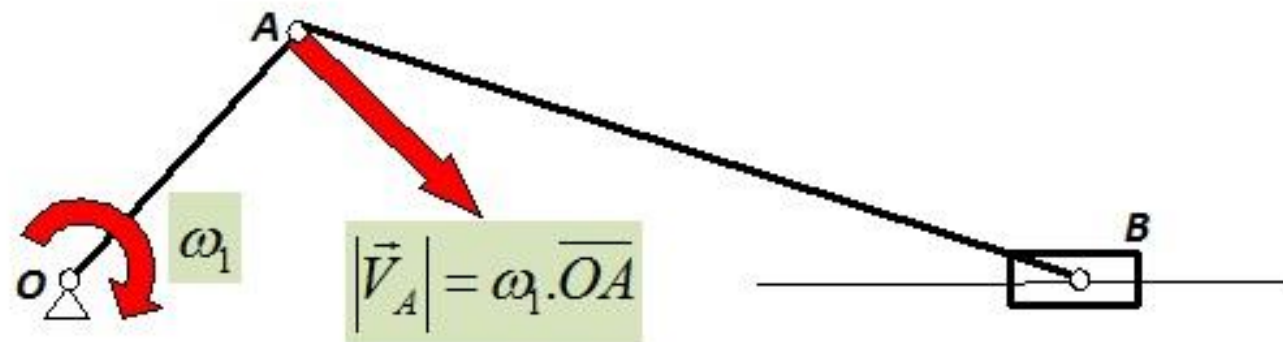
$$\bar{V}_A = \frac{|\vec{V}_A|}{k_V} = \frac{1,5}{0,05} = 30\text{mm}$$



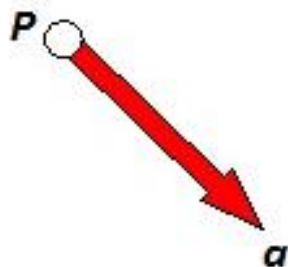
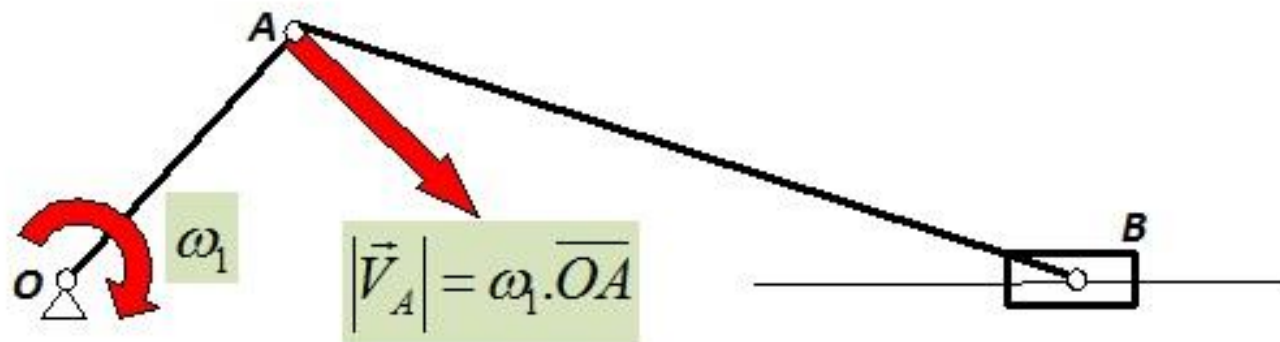
$$\bar{V}_A = \frac{|\vec{V}_A|}{k_V} = \frac{1,5}{0,05} = 30\text{mm}$$



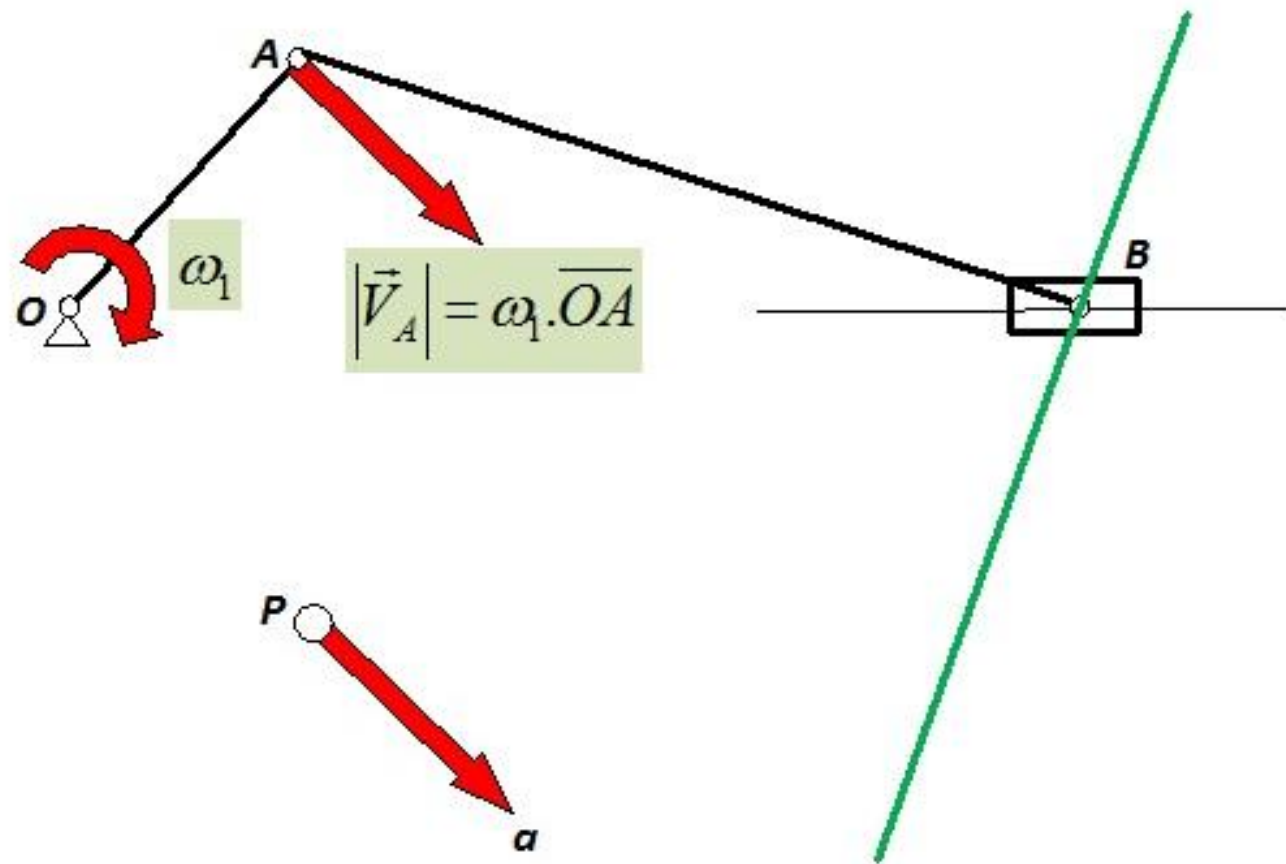
$$\bar{V}_A = \frac{|\vec{V}_A|}{k_V} = \frac{1,5}{0,05} = 30\text{mm}$$



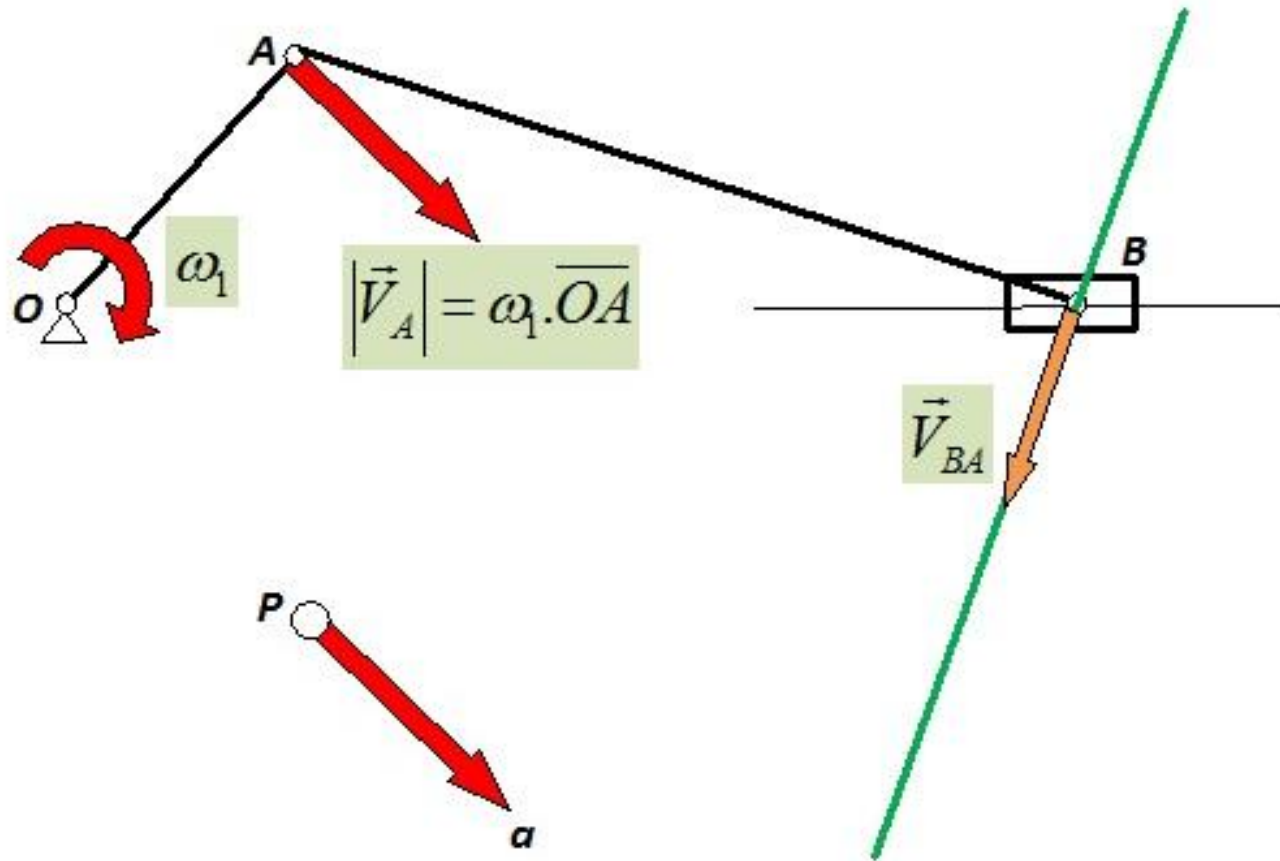
$$\underline{\underline{\vec{V}_B}} = \underline{\underline{\vec{V}_A}} + \underline{\underline{\vec{V}_{BA}}}$$



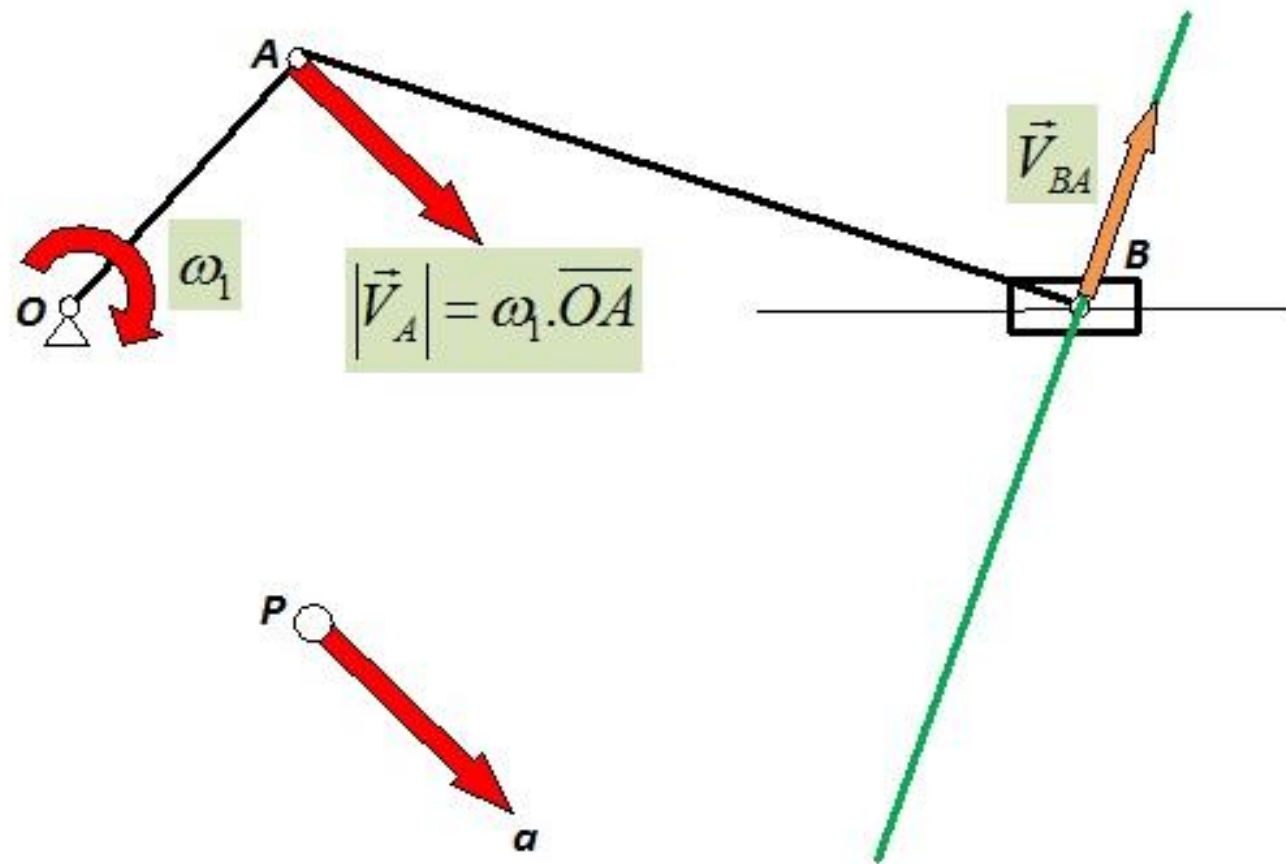
$$\bar{V}_A = \frac{|\vec{V}_A|}{k_V} = \frac{1,5}{0,05} = 30\text{mm}$$



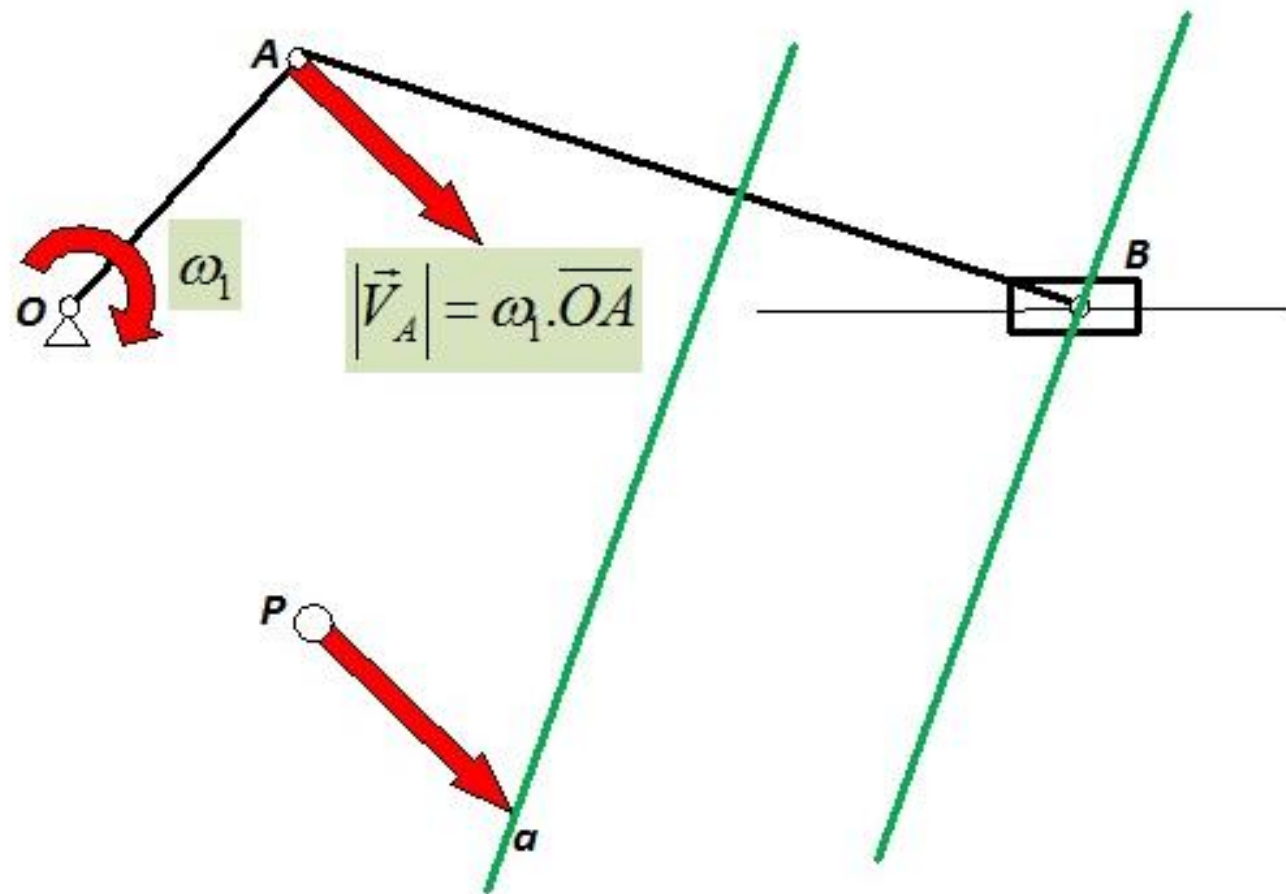
$$\bar{V}_A = \frac{|\vec{V}_A|}{k_V} = \frac{1,5}{0,05} = 30\text{mm}$$



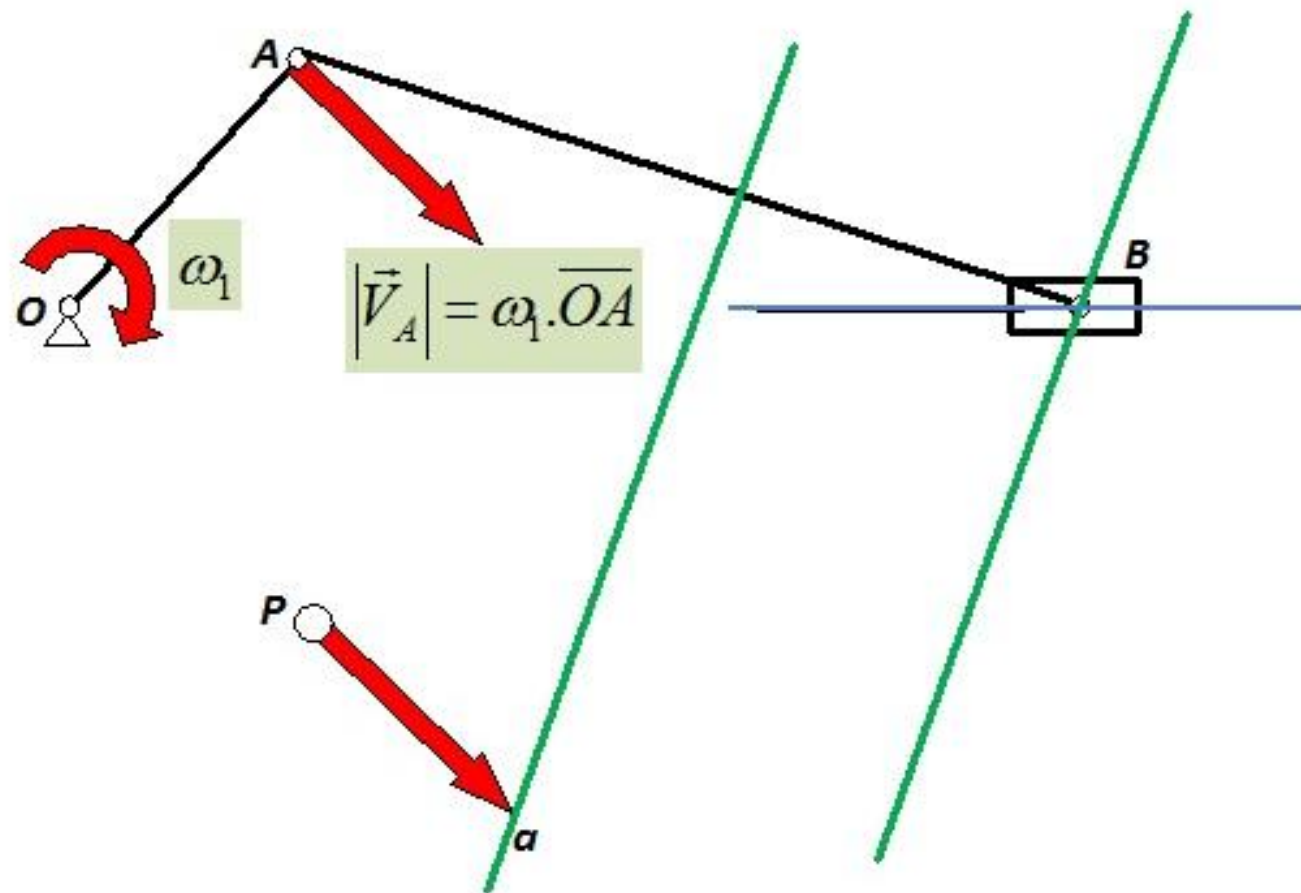
$$\bar{V}_A = \frac{|\vec{V}_A|}{k_V} = \frac{1,5}{0,05} = 30\text{mm}$$



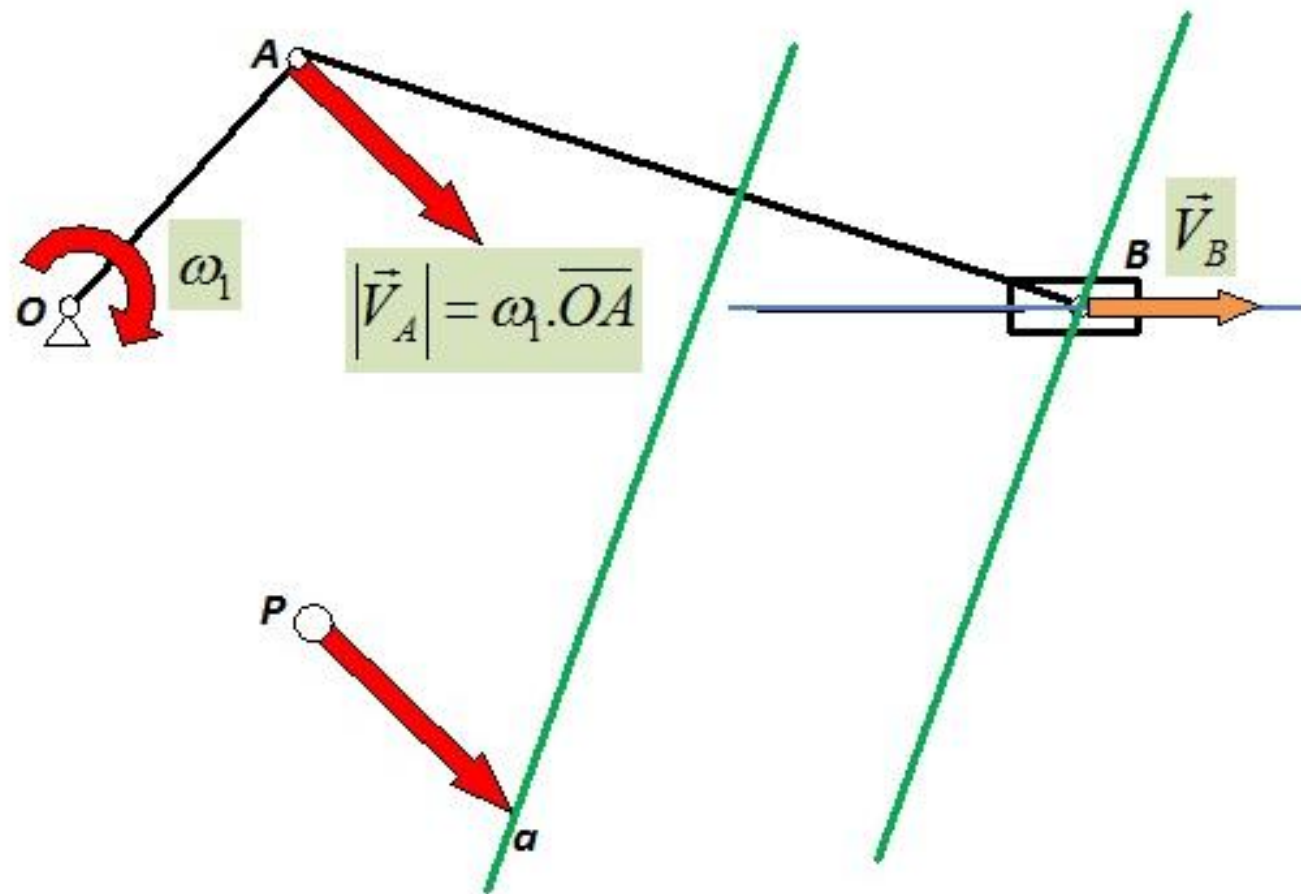
$$\bar{V}_A = \frac{|\vec{V}_A|}{k_V} = \frac{1,5}{0,05} = 30\text{mm}$$



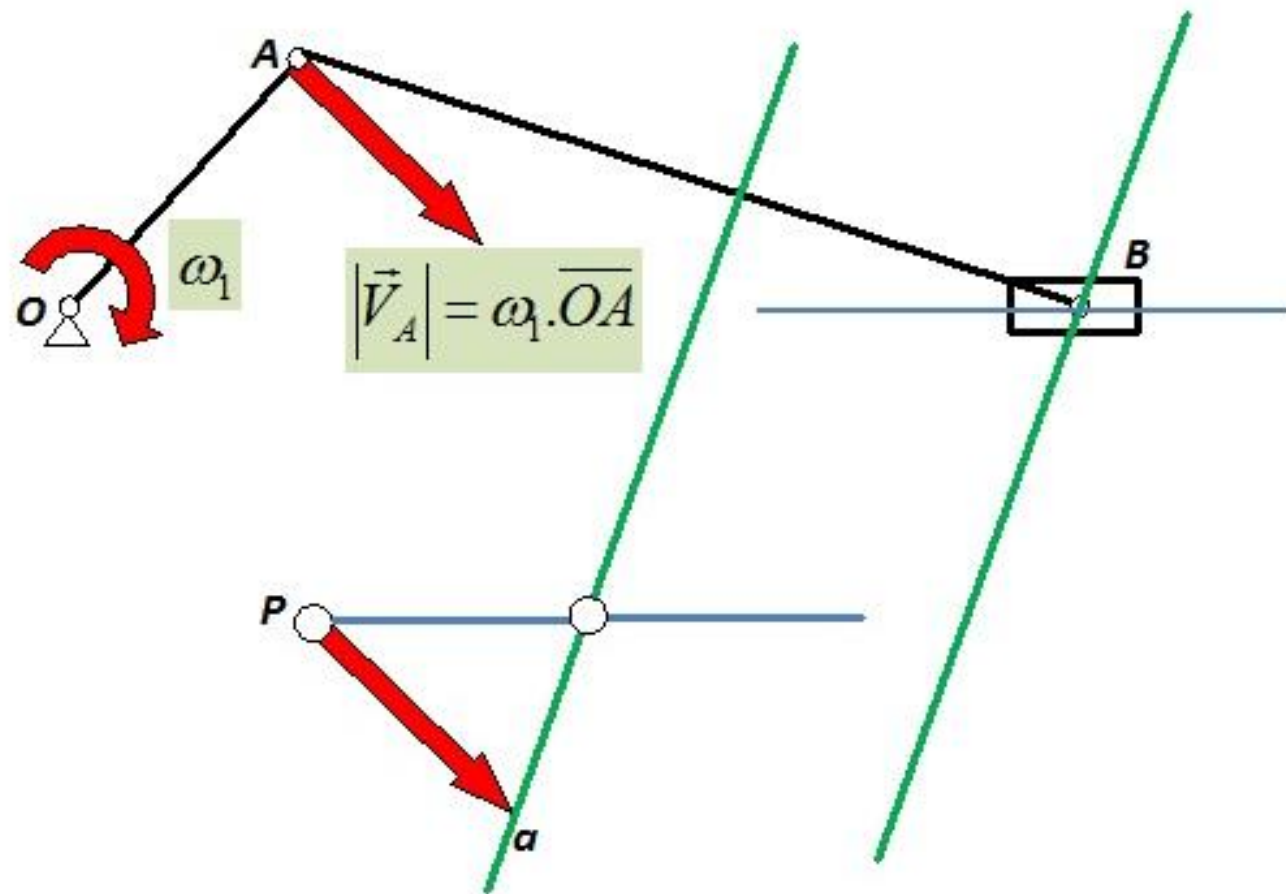
$$\bar{V}_A = \frac{|\vec{V}_A|}{k_V} = \frac{1,5}{0,05} = 30\text{mm}$$



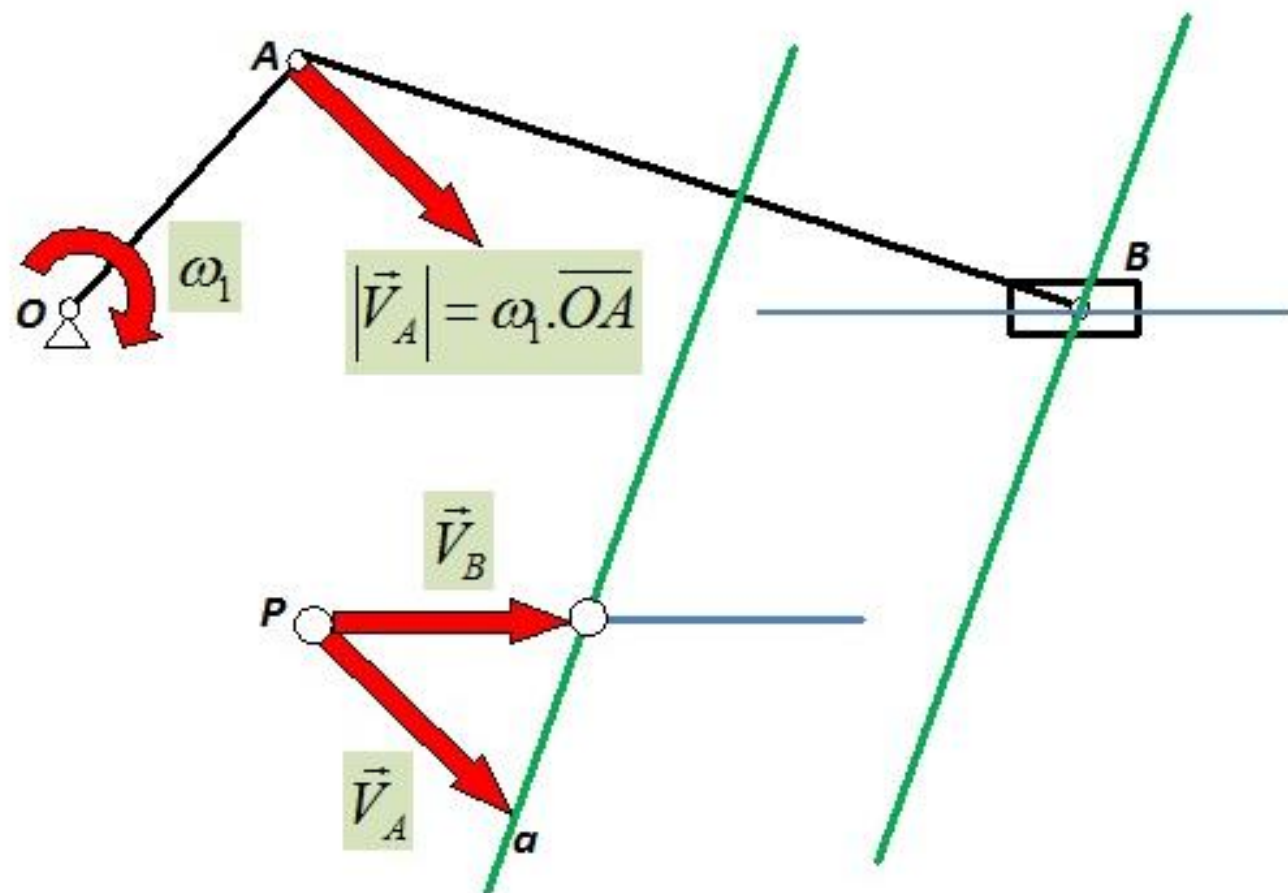
$$\bar{V}_A = \frac{|\vec{V}_A|}{k_V} = \frac{1,5}{0,05} = 30\text{mm}$$



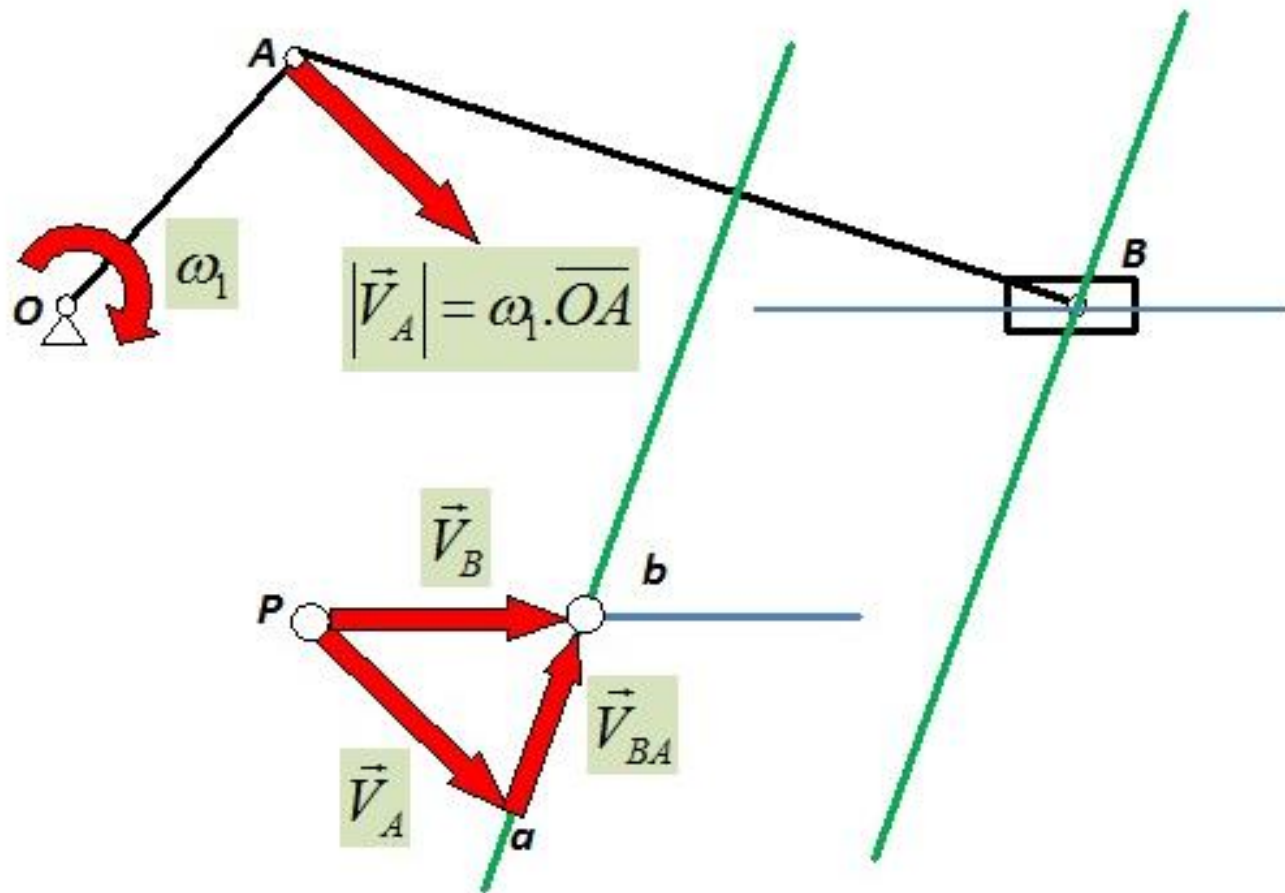
$$\bar{V}_A = \frac{|\vec{V}_A|}{k_V} = \frac{1,5}{0,05} = 30\text{mm}$$



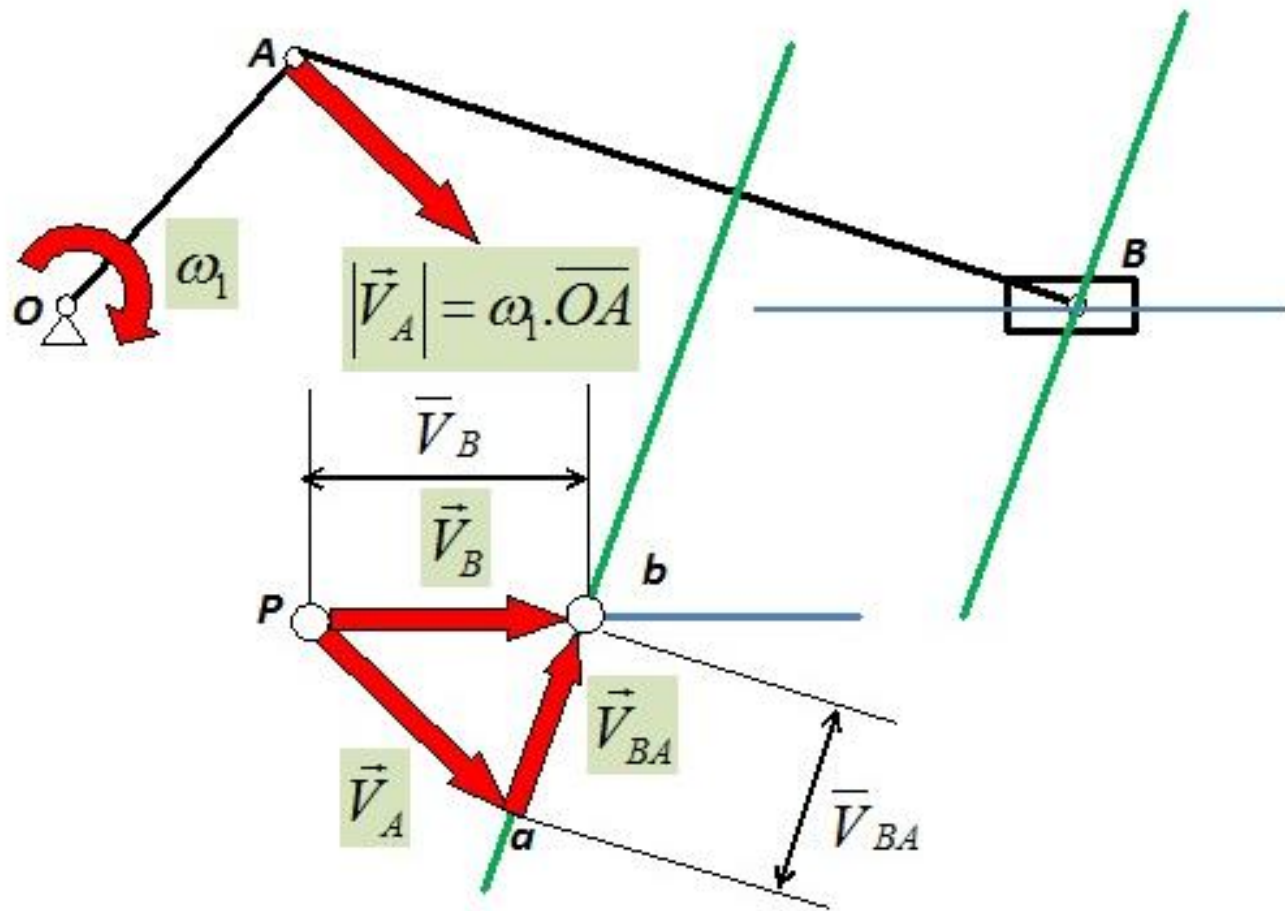
$$\bar{V}_A = \frac{|\vec{V}_A|}{k_V} = \frac{1,5}{0,05} = 30\text{mm}$$



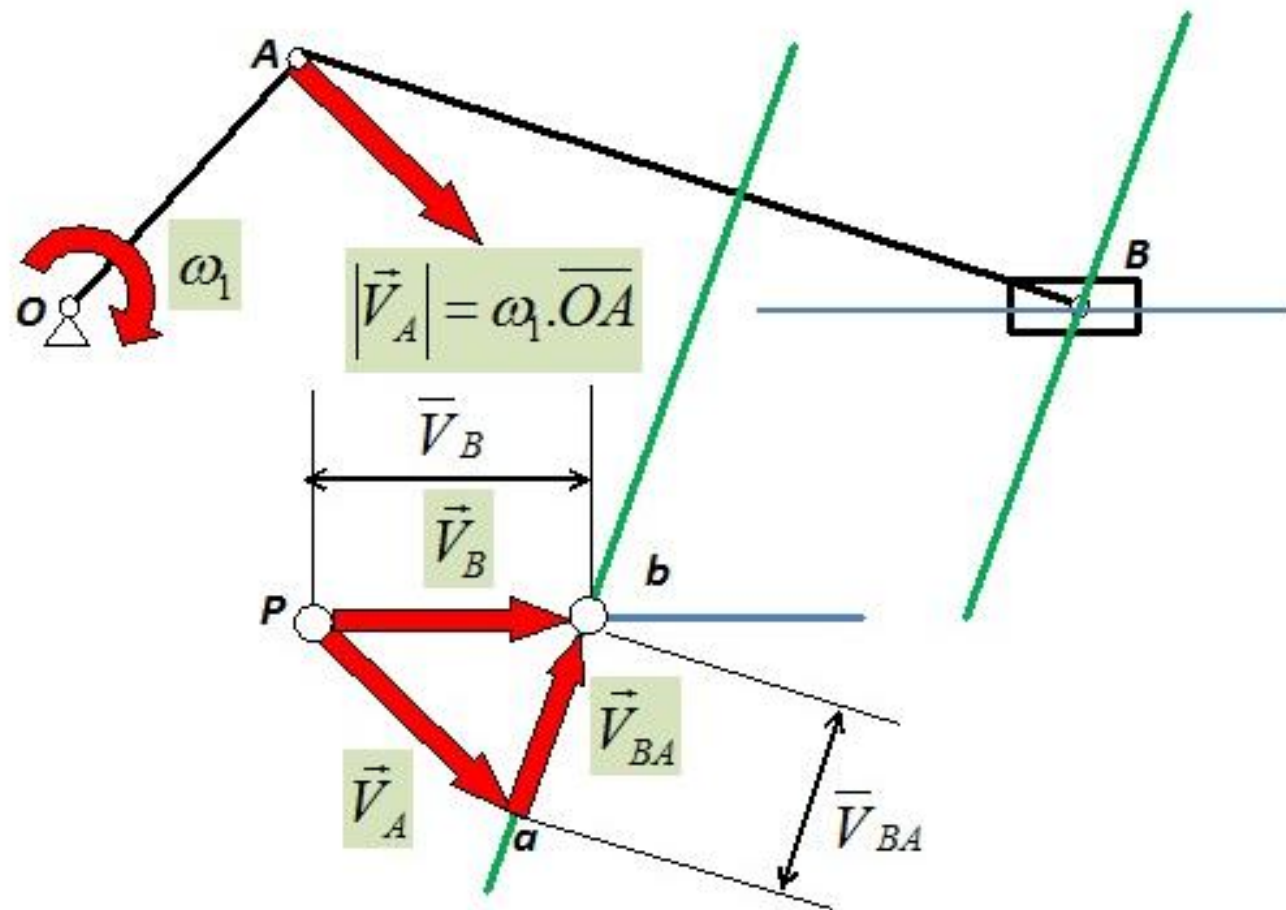
$$\bar{V}_A = \frac{|\vec{V}_A|}{k_V} = \frac{1,5}{0,05} = 30\text{mm}$$

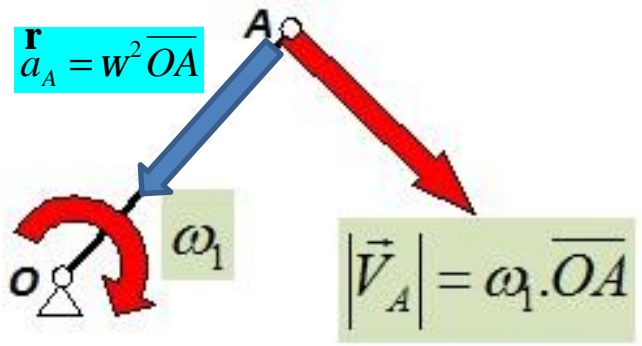


$$\bar{V}_A = \frac{|\vec{V}_A|}{k_V} = \frac{1,5}{0,05} = 30\text{mm}$$



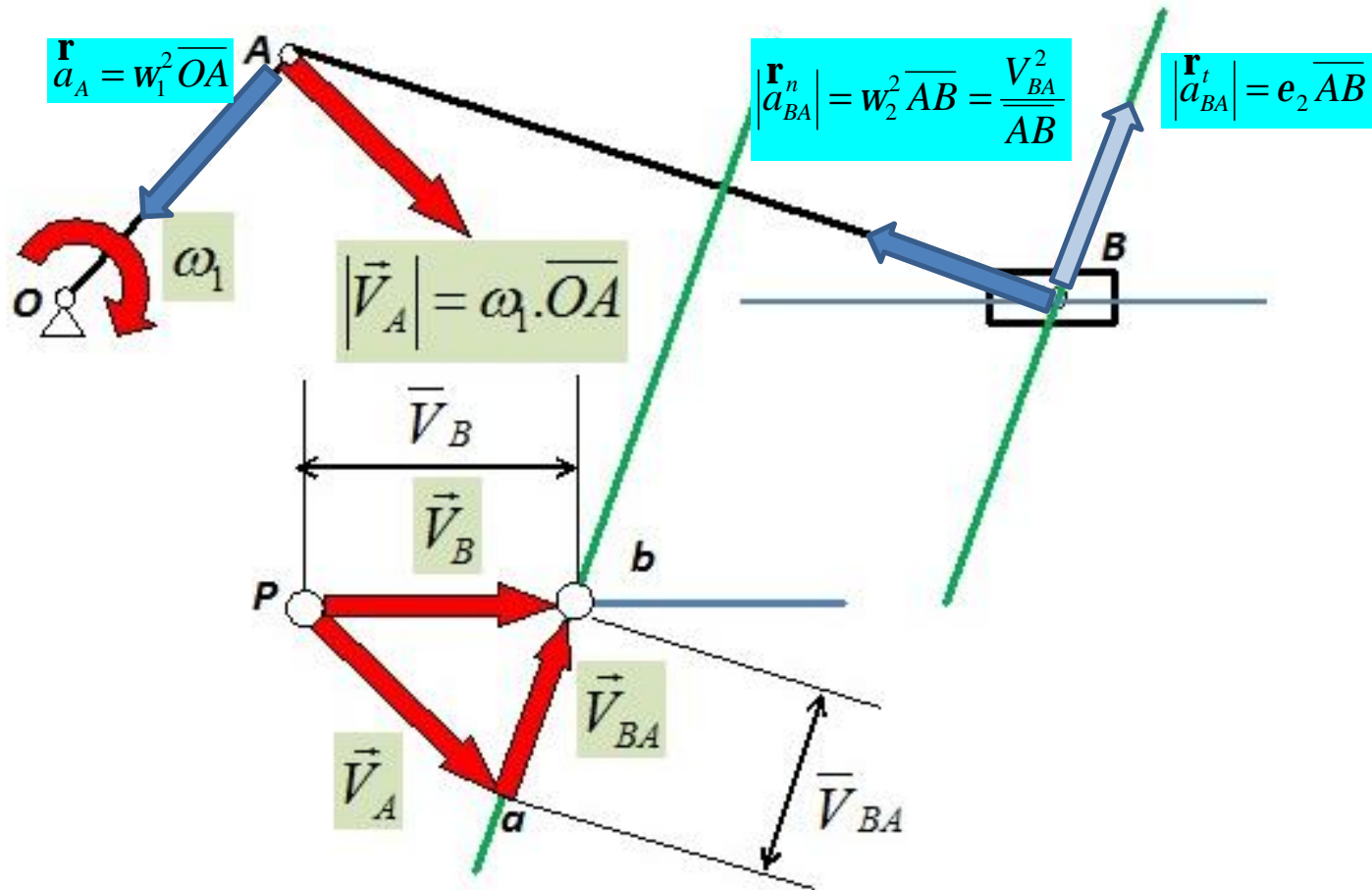
$$|\vec{V}_B| = \bar{V}_B \cdot k_V = 25\text{mm} \cdot 0,05 = 1,25 \left[\frac{\text{m}}{\text{s}} \right]$$





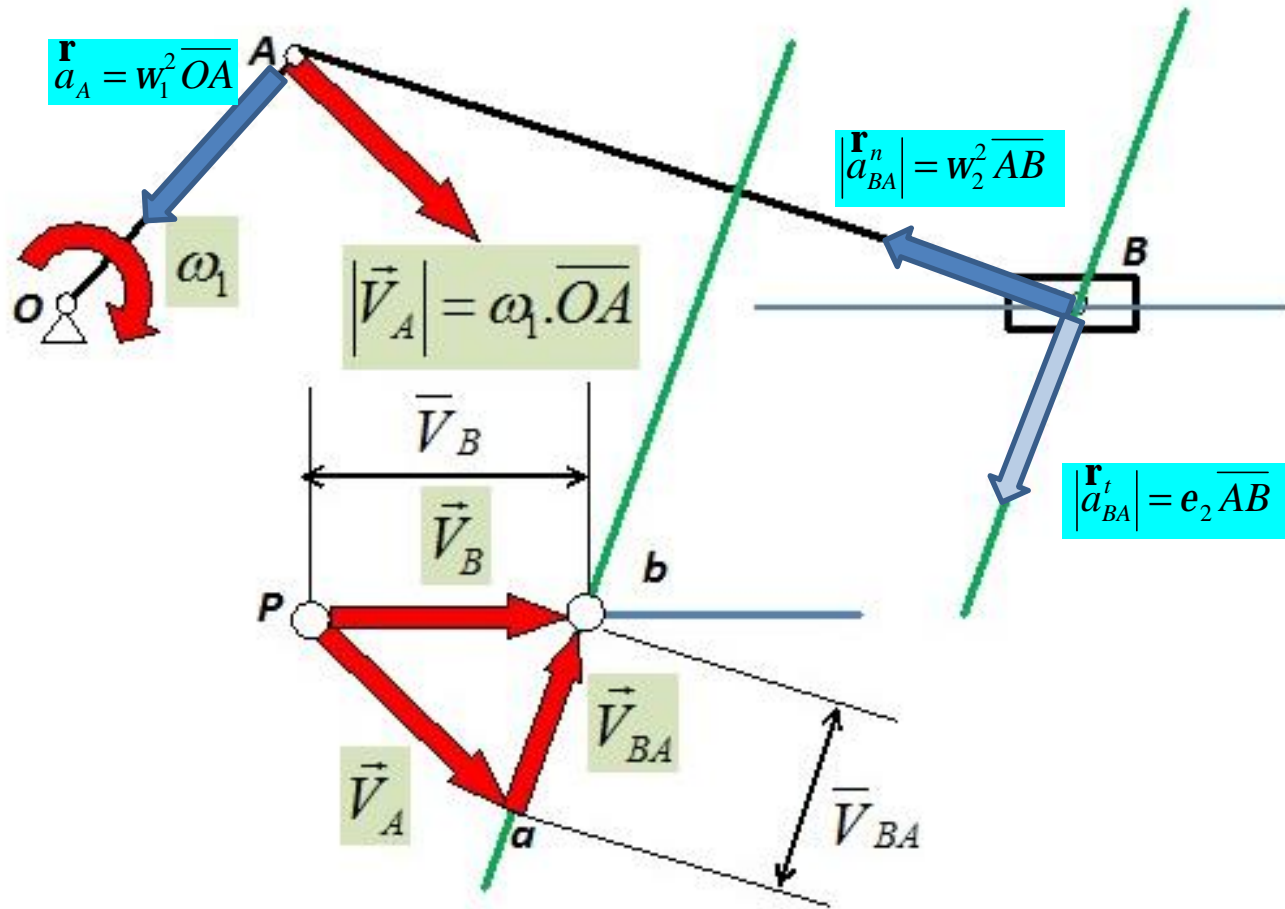
$$\underline{\mathbf{r}}_{a_A} = w_1^2 \overline{OA}$$

$$\underline{\mathbf{r}}_{a_B} = \underline{\mathbf{r}}_{a_A} + \underline{\mathbf{r}}_{a_{BA}^n} + \underline{\mathbf{r}}_{a_{BA}^t} \quad \left| \underline{\mathbf{r}}_{a_{BA}^n} \right| = w_2^2 \overline{AB} \quad ; \quad \left| \underline{\mathbf{r}}_{a_{BA}^t} \right| = e_2 \overline{AB}$$



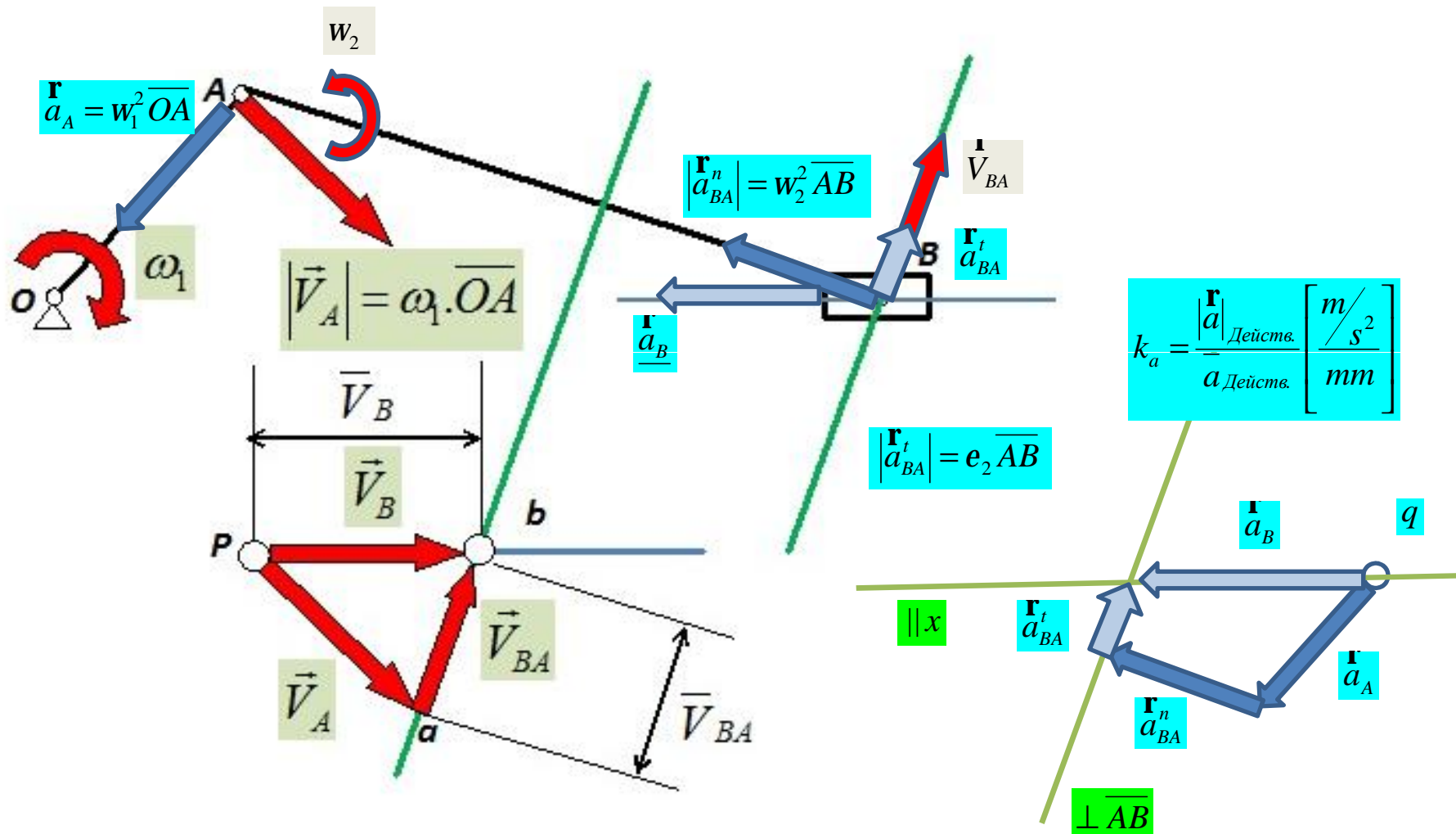
$$\underline{\mathbf{r}} a_A = w_1^2 \overline{OA}$$

$$\underline{\mathbf{r}} a_B = \underline{\mathbf{r}} a_A + \underline{\mathbf{r}} a_{BA}^n + \underline{\mathbf{r}} a_{BA}^t \quad \left| \underline{\mathbf{r}} a_{BA}^n \right| = w_2^2 \overline{AB} \quad ; \quad \left| \underline{\mathbf{r}} a_{BA}^t \right| = e_2 \overline{AB}$$



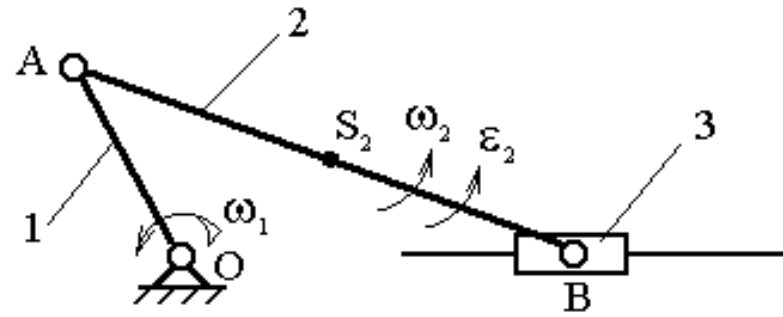
$$\underline{\mathbf{r}} a_A = w_1^2 \overline{OA}$$

$$\underline{\mathbf{r}} a_B = \underline{\mathbf{r}} a_A + \underline{\mathbf{r}} a_{BA}^n + \underline{\mathbf{r}} a_{BA}^t \quad \left| \underline{\mathbf{r}} a_{BA}^n \right| = w_2^2 \overline{AB} \quad ; \quad \left| \underline{\mathbf{r}} a_{BA}^t \right| = e_2 \overline{AB}$$

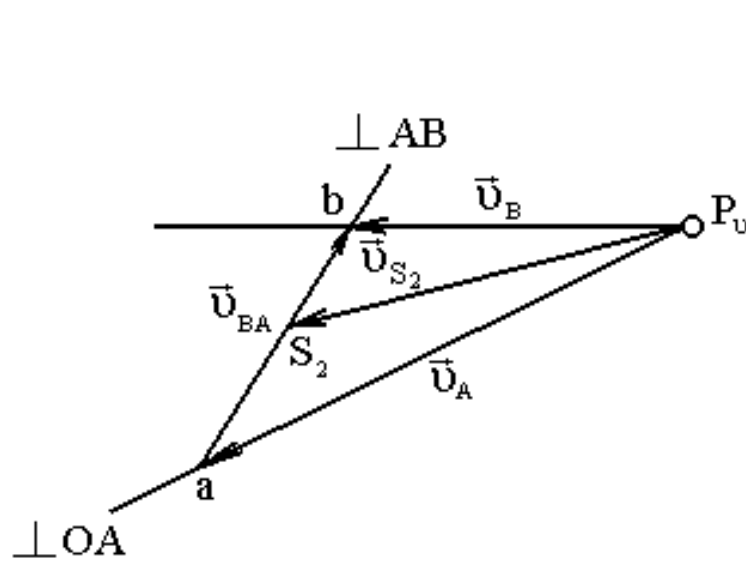


$$V_B = V_A + V_{BA'}$$

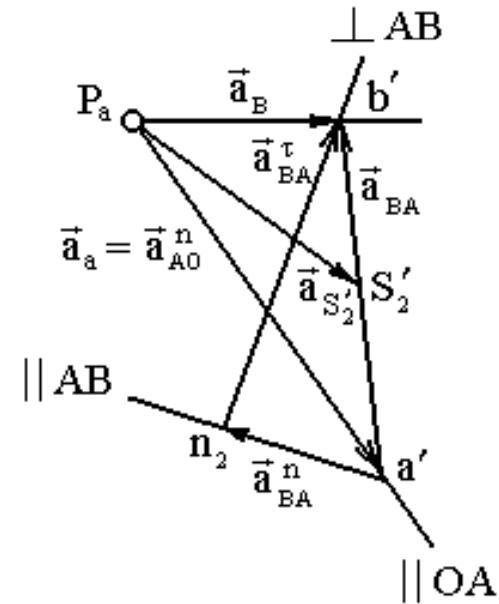
$$\mathbf{a}_B = \mathbf{a}_A + \mathbf{a}_{BA}^n + \mathbf{a}_{BA}^t \quad \mathbf{a}_A = \mathbf{a}_O + \mathbf{a}_{AO'} \quad \mathbf{a}_{AO} = \mathbf{a}_{AO}^n + \mathbf{a}_{AO}^t$$



План механизма (в масштабе длин μ_L)



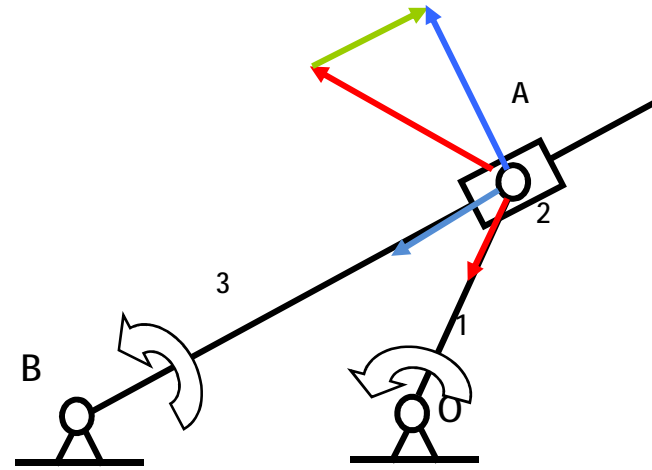
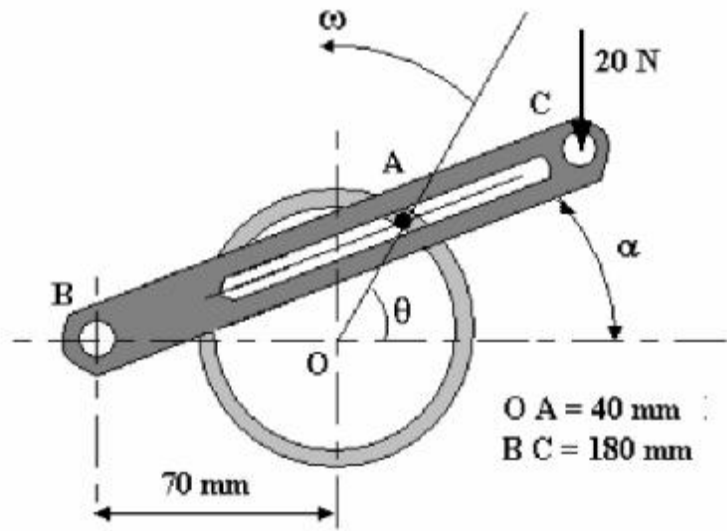
План скоростей



План ускорений

Скорости и ускорения на основни асурови групи

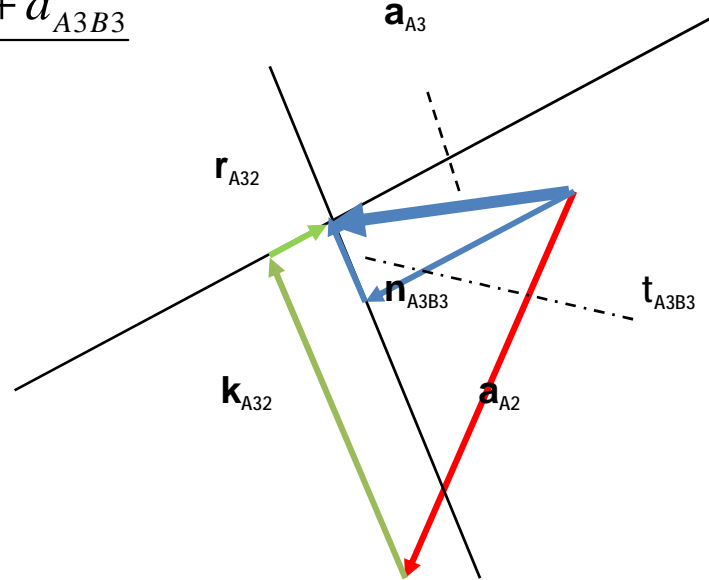
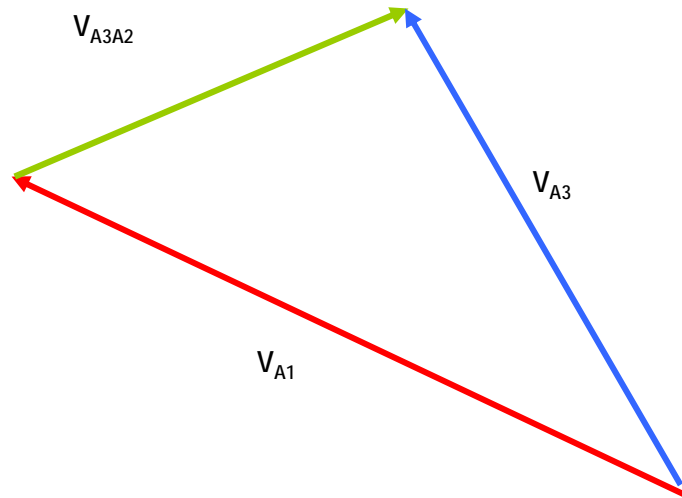
2. Тип RPR

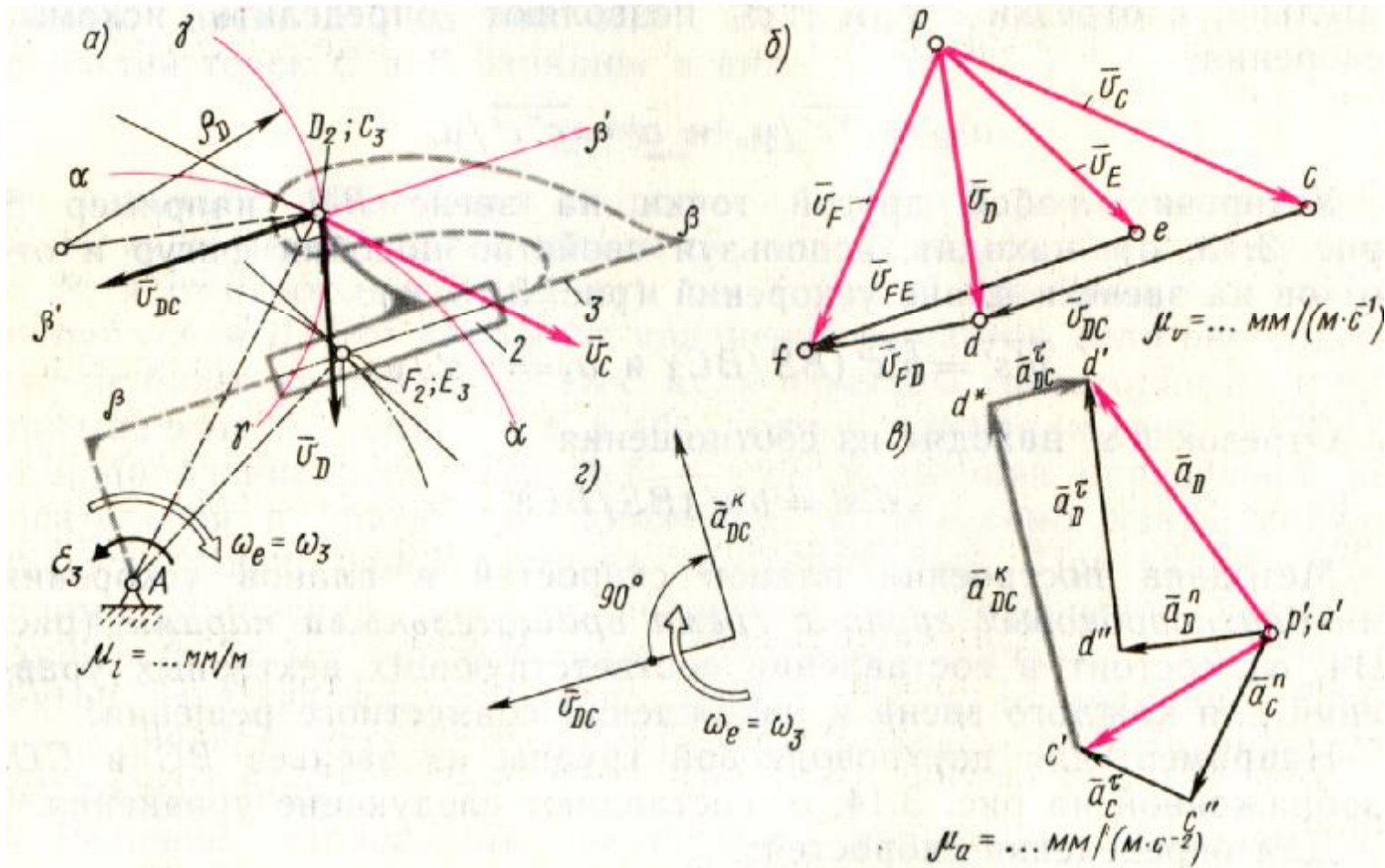


$$\begin{cases} \mathbf{r}_{A3} = \mathbf{r}_{A2} + \mathbf{r}_{A32} \\ \mathbf{r}_{A3} = \mathbf{r}_{B3} + \mathbf{r}_{A3B3} \end{cases}$$

$$\begin{cases} \mathbf{a}_{A3} = \mathbf{a}_{A2} + \mathbf{a}_{A32}^k + \mathbf{a}_{A32}^r \\ \mathbf{a}_{A3} = \mathbf{a}_{B3} + \mathbf{a}_{A3B3}^n + \mathbf{a}_{A3B3}^t \end{cases}$$

$$\mathbf{a}_{A32}^k = 2\omega_3 \times \mathbf{r}_{A3A2} \quad \mathbf{a}_{A3B3}^n = \omega_3^2 \overline{BA}$$

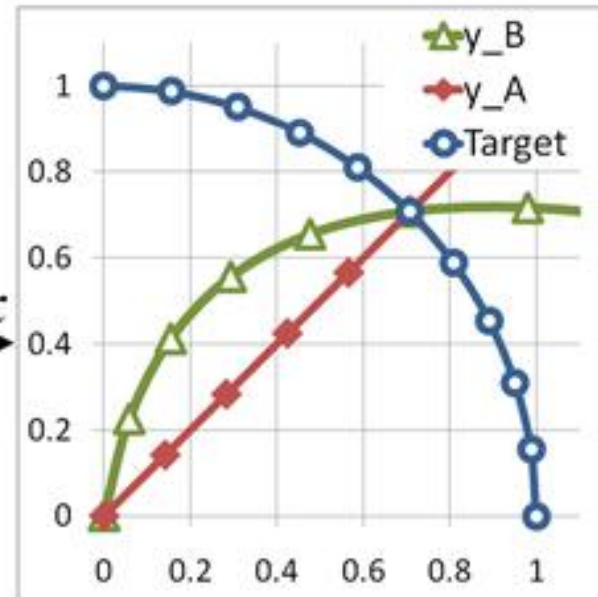
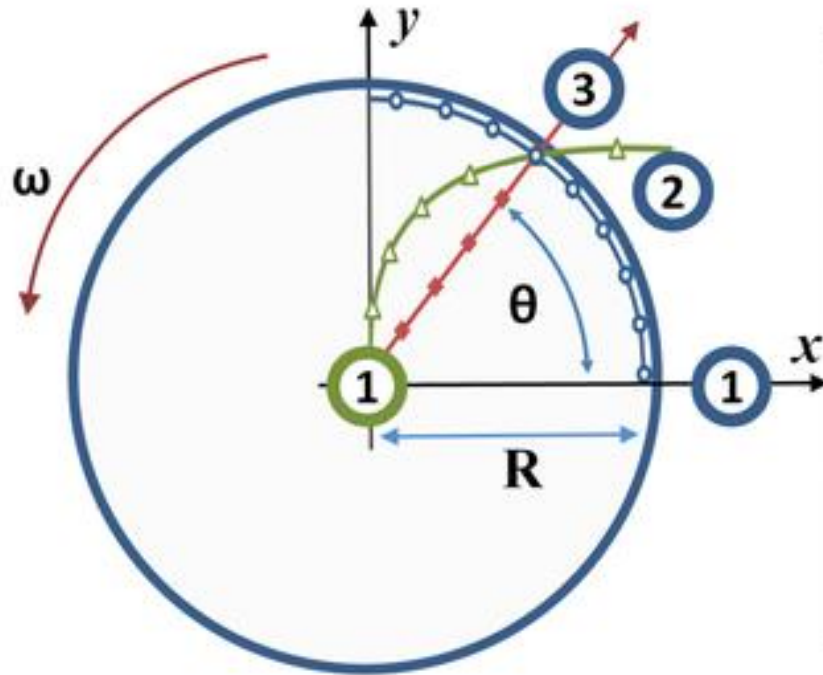
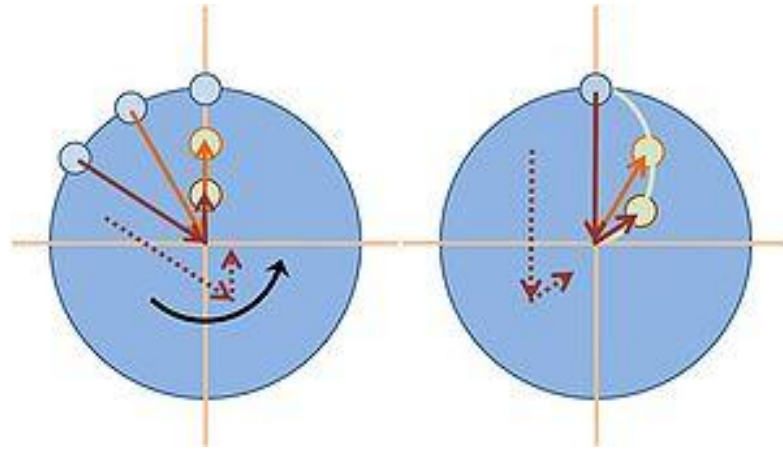


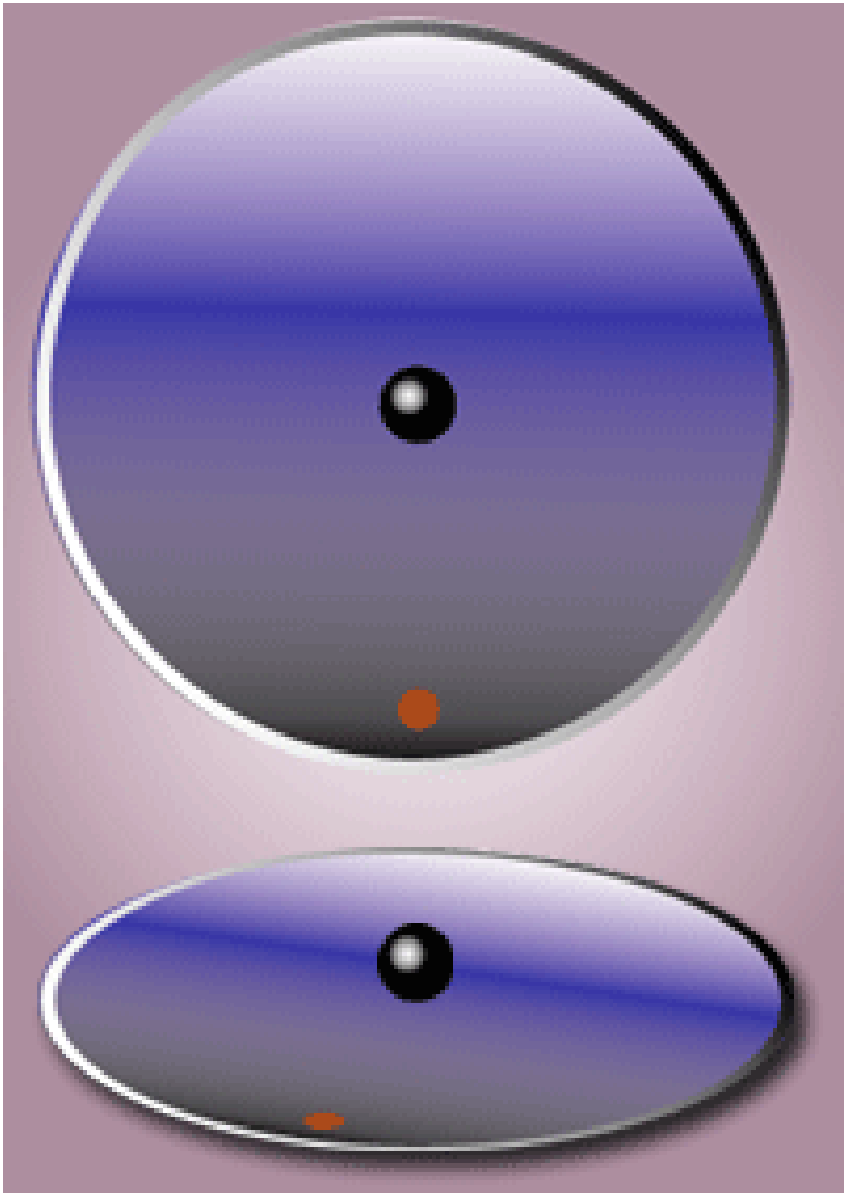


$$\dot{\mathbf{V}}_a = \dot{\mathbf{V}}_e + \dot{\mathbf{V}}_r \quad \dot{\mathbf{V}}_D = \dot{\mathbf{V}}_C + \dot{\mathbf{V}}_{DC} \quad \dot{\mathbf{V}}_{F2} = \dot{\mathbf{V}}_{E3} + \dot{\mathbf{V}}_{F2E3} \quad \dot{\mathbf{V}}_{F2} = \dot{\mathbf{V}}_E + \dot{\mathbf{V}}_{FE} \quad \dot{\mathbf{V}}_{FE} = \dot{\mathbf{V}}_{DC}$$

$$\mathbf{r}_{a_a} = \mathbf{r}_{a_e} + \mathbf{r}_{a_r} + \mathbf{r}_{a_k} = \mathbf{r}_{a_e} + \mathbf{r}_{a_r} + 2 \times (\mathbf{r}_{a_e} \times \dot{\mathbf{V}}_r) \quad \mathbf{r}_{a_D} = \mathbf{r}_{a_C} + \mathbf{r}_{a_{DC}} + \mathbf{r}_{a_{DC}}^k \quad \mathbf{r}_{a_D}^n + \mathbf{r}_{a_D}^t = \mathbf{r}_{a_C}^n + \mathbf{r}_{a_C}^t + \mathbf{r}_{a_{DC}}^k$$

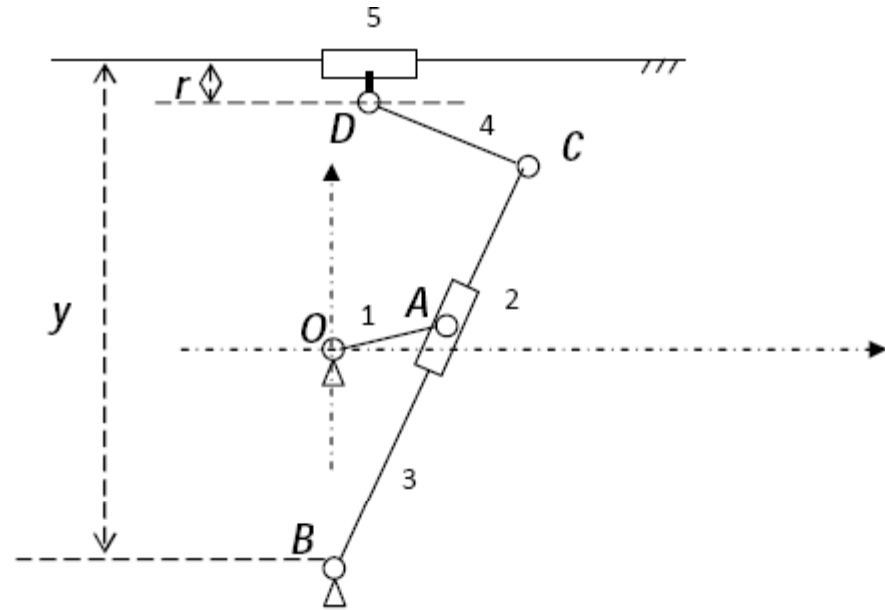
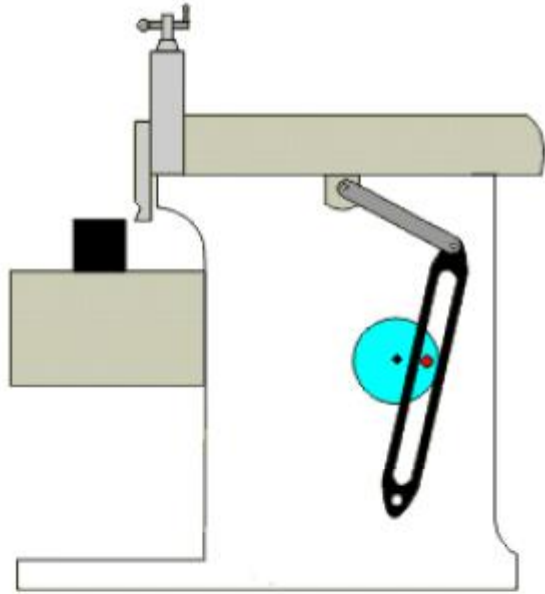
$$\mathbf{r}_{a_D}^n = \dot{\mathbf{V}}_D^2 / r_D \quad \mathbf{r}_{a_C}^n = \dot{\mathbf{V}}_C^2 / r_C \quad \mathbf{r}_{a_{DC}}^n = \dot{\mathbf{V}}_{DC}^2 / r_{DC} = \dot{\mathbf{V}}_{DC}^2 / \infty = 0 \quad a_C^t = e_3 r_C \quad a_{DC}^k = 2 \mathbf{r}_{a_e} \times \dot{\mathbf{V}}_r = 2 \mathbf{r}_{a_3} \times \dot{\mathbf{V}}_{DC}$$





Илюстрация на Кориолисова сила





$$\left| \underline{\mathbf{V}}_{A1} \right| = \left| \underline{\mathbf{V}}_{A2} \right| = w_1 \cdot \overline{OA} \left[\frac{m}{s} \right]$$

$$\underline{\mathbf{V}}_{A3} = \underline{\mathbf{V}}_{A2} + \underline{\mathbf{V}}_{A3A2}$$

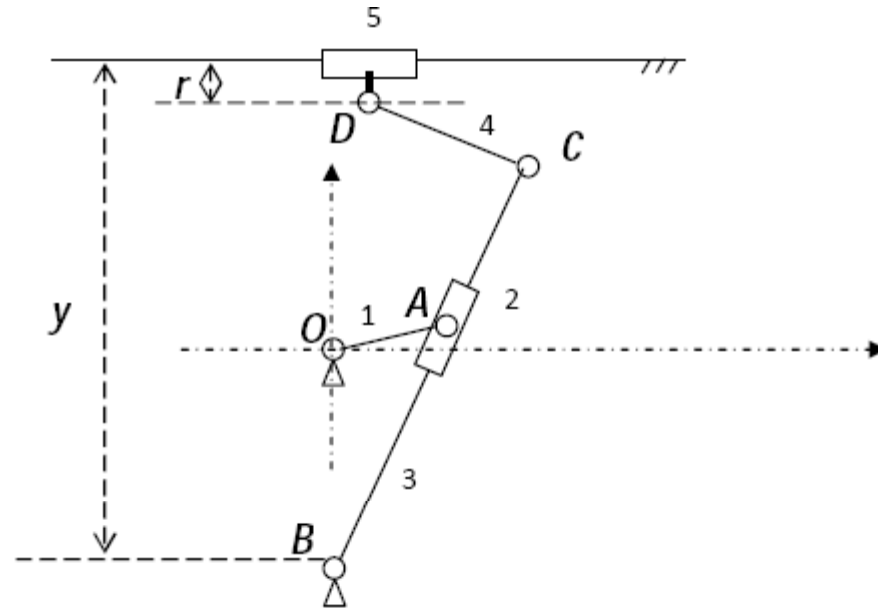
$$\underline{\mathbf{V}}_{A3} = \underline{\mathbf{V}}_B + \underline{\mathbf{V}}_{A3B3}$$

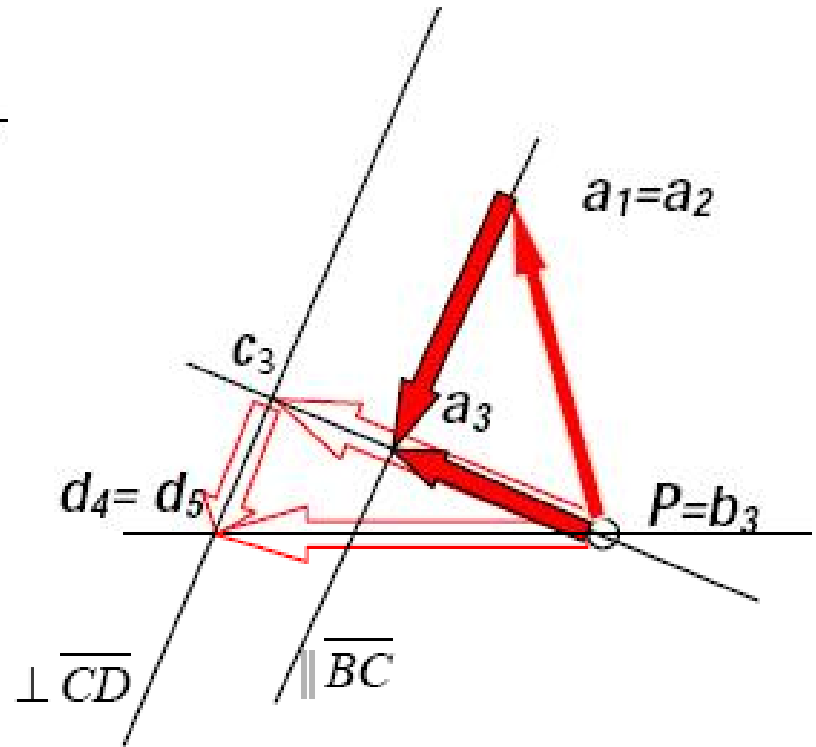
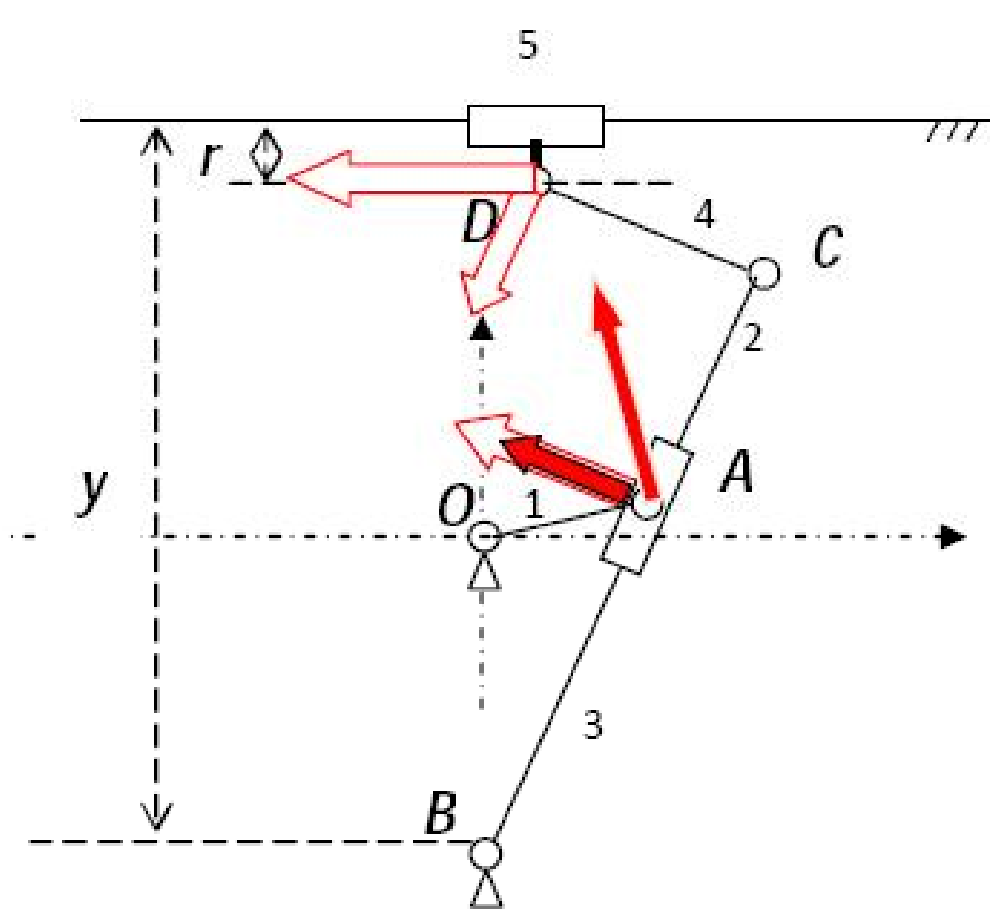
$$\underline{\mathbf{V}}_{C3} = w_3 \cdot \overline{BC} \left[\frac{m}{s} \right]$$

$$\underline{\mathbf{V}}_{C4} = \underline{\mathbf{V}}_{C3}$$

$$w_3 = \frac{\left| \underline{\mathbf{V}}_{A3} \right|}{BA} \left[\frac{rad}{s} \right]$$

$$\underline{\mathbf{V}}_{D4} = \underline{\mathbf{V}}_{C4} + \underline{\mathbf{V}}_{D4C4}$$





$$|\mathbf{V}_{A1}| = |\mathbf{V}_{A2}| = w_1 \cdot \overline{OA} \left[\frac{m}{s} \right]$$



$$|\mathbf{a}_{A1}| = |\mathbf{a}_{A2}| = w_1^2 \cdot \overline{OA} \left[\frac{m}{s^2} \right]$$

$$\mathbf{V}_{A3} = \mathbf{V}_{A2} + \mathbf{V}_{A3A2}$$



$$\mathbf{a}_{A3} = \mathbf{a}_{A2} + \mathbf{a}_{A3A2}^c + \mathbf{a}_{A3A2}^r$$

$$\mathbf{V}_{A3} = \mathbf{V}_B + \mathbf{V}_{A3B3}$$

$$\mathbf{a}_{A3} = \mathbf{a}_B + \mathbf{a}_{A3B}^n + \mathbf{a}_{A3B}^t$$

$\mathbf{V}_{C4} = \mathbf{V}_{C3}$

$$\mathbf{V}_{C3} = w_3 \cdot \overline{BC} \left[\frac{m}{s} \right]$$

$$\mathbf{a}_{B3A3}^c = 2w_2 \times \mathbf{V}_{A3A2}$$

$$\mathbf{a}_{A3B}^n = w_3^2 \overline{AB}$$

$$\mathbf{V}_{C4} = \mathbf{V}_{C3}$$



$$\mathbf{a}_{C4} = \mathbf{a}_{C3}$$

$$\mathbf{a}_{A3B}^t = \mathbf{e}_2 \times \overline{AB}$$

$$w_3 = \frac{|\mathbf{V}_{A3}|}{BA} \left[\frac{rad}{s} \right]$$

$$\mathbf{V}_{D4} = \mathbf{V}_{C4} + \mathbf{V}_{D4C4}$$



$$\mathbf{a}_{D4} = \mathbf{a}_{C4} + \mathbf{a}_{D4C4}^n + \mathbf{a}_{D4C4}^t$$

