



$$OM = S_z(t) = 6(t + 0,5t^2) \text{ (cm)}$$

$$\varphi_e(t) = t^3 - 5t \text{ (rad)}$$

$$t_1 = 2c, \alpha = 30^\circ$$

$$V_M = ?, a_M = ?$$

$$S_z = 6(t + 0,5t^2) \Big|_{t=2c} = 24 \text{ [cm]}, \quad \vec{V} = \vec{V}_z + \vec{V}_e,$$

$$V_z = |\vec{V}_z|, \quad \tilde{V}_z = dS_z/dt = 6 + 6t \Big|_{t=2c} = 18 \text{ [cm/c]}, \quad V_z = 18 \text{ [cm/c]}$$

$$V_e = R\omega_e, \quad R = S_z \sin \alpha = 24 \cdot \sin 30^\circ = 12 \text{ [cm]}, \quad \omega_e = |\tilde{\omega}_e|, \quad \tilde{\omega}_e = d\varphi_e/dt = 3t^2 - 5 \Big|_{t=2c} = 7 \text{ [rad/c]}$$

$$V_e = 7 \cdot 12 = 84 \text{ [cm/c]}, \quad \text{m.k. } \vec{V}_z \perp \vec{V}_e \Rightarrow V = \sqrt{V_e^2 + V_z^2} = \sqrt{84^2 + 18^2} = 85,9 \text{ [cm/c]}$$

$$\vec{a} = \vec{a}_z^T + \vec{a}_z^n + \vec{a}_e^T + \vec{a}_e^n + \vec{a}_c$$

$$a_z^T = |\tilde{a}_z^T|, \quad \tilde{a}_z^T = d^2 S_z / dt^2 = 6 \text{ [cm/c^2]}, \quad a_z^T = 6 \text{ [cm/c^2]}, \quad a_z^n = V_z^2 / \rho = 0, \text{ m.k. } \rho \rightarrow \infty$$

$$a_e^T = R \cdot \tilde{\varepsilon}_e, \quad \tilde{\varepsilon}_e = |\tilde{\varepsilon}_e|, \quad \tilde{\varepsilon}_e = d^2 \varphi_e / dt^2 = 6t \Big|_{t=2c} = 12 \text{ [rad/c^2]}, \quad a_e^T = 12 \cdot 12 = 144 \text{ [cm/c^2]}$$

$$a_e^n = R \omega_e^2 = 12 \cdot 49 = 588 \text{ [cm/c^2]}$$

$$\vec{a}_c = 2 \vec{\omega}_e \times \vec{V}_z, \quad a_c = 2 \omega_e V_z \sin(\vec{\omega}_e, \vec{V}_z), \quad \sin(\vec{\omega}_e, \vec{V}_z) = \sin(180^\circ - \alpha) = \sin 150^\circ = 0,5$$

$$a_c = 2 \cdot 7 \cdot 18 \cdot 0,5 = 126 \text{ [cm/c^2]}$$

$$\left\{ \begin{aligned} a_x &= a_e^T + a_c = 144 + 126 = 270 \text{ [cm/c^2]}; & a_y &= a_z^T \sin \alpha - a_e^n = 6 \sin 30^\circ - 588 = -585 \text{ [cm/c^2]} \\ a_z &= a_z^T \cos \alpha = 6 \cos 30^\circ = 6 \cdot 0,87 = 5,22. \end{aligned} \right.$$

$$a = \sqrt{a_x^2 + a_y^2 + a_z^2} = \sqrt{5,22^2 + 270^2 + 585^2} = 634,3 \text{ [cm/c^2]}$$

[Signature]
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$\tilde{\omega}_e,$ $(\frac{\text{рад}}{\text{с}})$	Скорость, $\frac{\text{см}}{\text{с}}$			$\tilde{\varepsilon}_e,$ $\frac{\text{рад}}{\text{с}^2}$	Ускорение, см/с^2								
	\tilde{v}_e	\tilde{v}_z	\tilde{v}		a_e^n	a_e^z	a_z^n	\tilde{a}_z^z	a_c	a_x	a_y	a_z	a
7	84	18	85,9	12	588	144	0	6	126	270	-585	5,22	634,3