ТЕОРИЯ КРИВЫХ

Формулы Сере-Френе

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$$\frac{d\bar{\tau}}{ds} = \bar{\tau}' = (\bar{r}')' = \bar{r}'' \overset{(18)}{=} k \cdot \bar{v}$$

$$\frac{d\bar{\beta}}{ds} = \bar{\beta}' \overset{(19)}{=} [\bar{\tau};\bar{v}]' = [\bar{\tau}';\bar{v}] + [\bar{\tau};\bar{v}'] = [k\bar{v};\bar{v}] + [\bar{\tau};\bar{v}'] = [\bar{\tau};\bar{v}']$$

$\frac{d\bar{\beta}}{ds} \perp \bar{\beta}$,в силу утверждения 1 раздела «Векторный анализ»

$\frac{d\bar{\beta}}{ds} \perp \bar{\tau}$

$$\left.\begin{aligned} &\frac{d\bar{\beta}}{ds} \perp \bar{\beta} \\ &\frac{d\bar{\beta}}{ds} \perp \bar{\tau} \end{aligned}\right\} \Rightarrow \frac{d\bar{\beta}}{ds} \parallel \bar{v}$$

$$\Rightarrow \frac{d\bar{\beta}}{ds} = -\chi \bar{v}$$

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$$\overline{\nu}' = \frac{d\overline{\nu}}{ds} \overset{(22)}{=} [\overline{\beta};\overline{\tau}]' = [\overline{\beta}';\overline{\tau}] + [\overline{\beta};\overline{\tau}'] = [-\chi\overline{\nu};\overline{\tau}] + [\overline{\beta};k\overline{\nu}] =$$

$$= -\chi[\overline{\nu};\overline{\tau}] + k[\overline{\beta};\overline{\nu}] \overset{(22)}{=} \chi\overline{\beta} - k\overline{\tau}$$

$$\begin{cases} \dfrac{d\overline{\tau}}{ds} = k\overline{\nu} \\ \dfrac{d\overline{\nu}}{ds} = -k\overline{\tau} + \chi\overline{\beta} \\ \dfrac{d\overline{\beta}}{ds} = -\chi\overline{\nu} \end{cases} \qquad (23)$$

(23) – формулы Сере-Френе.

ВЫХОД

Утверждение 1:

Для того чтобы $\bar{u}' \perp \bar{u}$ необходимо и достаточно, чтобы $|\bar{u}| = const$.

$$\frac{\bar{r}''}{k} = \frac{\bar{r}''}{|\bar{r}''|} = \bar{v} \qquad (18)$$

$$\overline{\beta} \equiv [\overline{\tau}; \overline{v}] \tag{19}$$

$$\begin{cases} [\overline{\tau};\overline{\tau}] = \overline{0} & [\overline{\nu};\overline{\tau}] = -\overline{\beta} & [\overline{\beta};\overline{\nu}] = -\overline{\tau} \\ [\overline{\tau};\overline{\nu}] = \overline{\beta} & [\overline{\nu};\overline{\nu}] = \overline{0} & [\overline{\beta};\overline{\tau}] = \overline{\nu} \\ [\overline{\tau};\overline{\beta}] = -\overline{\nu} & [\overline{\nu};\overline{\beta}] = \overline{\tau} & [\overline{\beta};\overline{\beta}] = \overline{0} \end{cases} \quad (22)$$