D.N.

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DANA JE KRIVULJA $\vec{r}(t) = (t-1, t, t^2)$, $t \in [-3,1]$

POIŠČI TISTI TOČKI NA KRIVULJI, V KATERIH JE FLEKSIJSKA UKRIVLJENOST NAJVEČJA OZ. NAJMANJŠA.

$$\varkappa(t) = \frac{\|\dot{\vec{r}}(t) \times \ddot{\vec{r}}(t)\|}{\|\dot{\vec{r}}(t)\|^3}$$

$$\left.\begin{aligned} \dot{\vec{r}}(t) &= (1, 1, 2t) \\ \ddot{\vec{r}}(t) &= (0,0,2) \end{aligned}\right\} \quad \dot{\vec{r}}(t) \times \ddot{\vec{r}}(t) = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 1 & 1 & 2t \\ 0 & 0 & 2 \end{vmatrix} = (2,-2,0) \Rightarrow$$

$$\|\dot{\vec{r}}(t) \times \ddot{\vec{r}}(t)\| = \sqrt{4+4} = 2\sqrt{2}$$

$$\|\dot{\vec{r}}(t)\| = \sqrt{1+1+4t^2} = \sqrt{2}\sqrt{1+2t^2} \Rightarrow \|\dot{\vec{r}}(t)\|^3 = 2\sqrt{2}\,(1+2t^2)^{3/2}$$

$$\varkappa(t) = \frac{2\sqrt{2}}{2\sqrt{2}\,(1+2t^2)^{3/2}} = (1+2t^2)^{-\frac{3}{2}}$$

IŠČEMO GLOBALNE EKSTREME FUNKCIJE $(1+2t^2)^{-3/2}$ NA INT. $[-3,1]$:

$$\varkappa'(t) = -\tfrac{3}{2}(1+2t^2)^{-\frac{5}{2}} \cdot 4t = 0 \Rightarrow t = 0$$

$$\left.\begin{aligned} \varkappa(-3) &= (1+2\cdot 9)^{-3/2} = \frac{1}{19^{3/2}} \\ \varkappa(0) &= 1 \\ \varkappa(1) &= \frac{1}{3^{3/2}} \end{aligned}\right\} \quad \begin{aligned} &\text{MAX PRI } t=0 : A(-1,0,0) \\ &\text{MIN PRI } t=-3 : B(-4,-3,9) \end{aligned}$$