Curvas elementares para avanço e retorno e suas derivadas

| perfil | f(A) | $\mathrm{f}^{\prime}(\mathrm{A})$ | f'(A) | intervalo |
| :---: | :---: | :---: | :---: | :---: |
| avanço parabólico | $\begin{gathered} 2 \cdot \mathrm{~L} \cdot\left(\frac{\mathrm{~A}}{\mathrm{~A} 1}\right)^{2} \\ \mathrm{~L} \cdot\left[1-2 \cdot\left(\frac{\mathrm{~A} 1-\mathrm{A}}{\mathrm{~A} 1}\right)^{2}\right] \end{gathered}$ | $\begin{gathered} \frac{4 \cdot \mathrm{~A} \cdot \mathrm{~L}}{\mathrm{~A} 1^{2}} \\ -\frac{4 \cdot \mathrm{~L} \cdot(\mathrm{~A}-\mathrm{A} 1)}{\mathrm{Al}^{2}} \end{gathered}$ | $\begin{array}{r} \frac{4 \cdot \mathrm{~L}}{} \\ \mathrm{~A} 1^{2} \\ -\frac{4 \cdot \mathrm{~L}}{\mathrm{~A}^{2}} \end{array}$ | $\begin{aligned} & 0 \leq \mathrm{A}<\frac{\mathrm{A} 1}{2} \\ & \frac{\mathrm{~A} 1}{2} \leq \mathrm{A}<\mathrm{A} 1 \end{aligned}$ |
| avanço cúbico | $\begin{gathered} 4 \cdot \mathrm{~L} \cdot\left(\frac{\mathrm{~A}}{\mathrm{~A} 1}\right)^{3} \\ \mathrm{~L} \cdot\left[1-4 \cdot\left(\frac{\mathrm{~A} 1-\mathrm{A}}{\mathrm{~A} 1}\right)^{3}\right] \end{gathered}$ | $\begin{gathered} \frac{12 \cdot \mathrm{~A}^{2} \cdot \mathrm{~L}}{\mathrm{~A} 1^{3}} \\ \frac{12 \cdot \mathrm{~L} \cdot(\mathrm{~A}-\mathrm{A} 1)^{2}}{\mathrm{~A} 1^{3}} \end{gathered}$ | $\begin{gathered} \frac{24 \cdot \mathrm{~A} \cdot \mathrm{~L}}{\mathrm{~A} 1^{3}} \\ \frac{24 \cdot \mathrm{~L} \cdot(\mathrm{~A}-\mathrm{A} 1)}{\mathrm{A1} 1^{3}} \end{gathered}$ | $0 \leq \mathrm{A}<\frac{\mathrm{A} 1}{2}$ $\frac{\mathrm{A} 1}{2} \leq \mathrm{A}<\mathrm{A} 1$ |
| avanço senoidal | $\frac{\mathrm{L}}{2} \cdot\left(1-\cos \left(\frac{\pi \cdot \mathrm{A}}{\mathrm{A} 1}\right)\right)$ | $\frac{\pi \cdot \mathrm{L}}{2 \cdot \mathrm{~A} 1} \cdot \sin \left(\frac{\pi \cdot \mathrm{~A}}{\mathrm{~A} 1}\right)$ | $\frac{\pi^{2} \cdot \mathrm{~L}}{2 \cdot \mathrm{A1}} \cdot \mathrm{cos}\left(\frac{\pi \cdot \mathrm{A}}{\mathrm{A} 1}\right)$ | $0 \leq \mathrm{A}<\mathrm{A} 1$ |
| avanço cicloidal | $\frac{\mathrm{L}}{\pi} \cdot\left(\frac{\pi \cdot \mathrm{A}}{\mathrm{A} 1}-\frac{1}{2} \cdot \sin \left(\frac{2 \cdot \pi \cdot \mathrm{~A}}{\mathrm{~A} 1}\right)\right)$ | $\frac{\mathrm{L}}{\mathrm{A} 1} \cdot\left(1-\cos \left(\frac{2 \cdot \pi \cdot \mathrm{~A}}{\mathrm{~A} 1}\right)\right)$ | $\frac{2 \pi \cdot \mathrm{~L}}{\mathrm{Al}^{2}} \cdot \sin \left(\frac{2 \cdot \pi \cdot \mathrm{~A}}{\mathrm{~A} 1}\right)$ | $0 \leq \mathrm{A}<\mathrm{A} 1$ |
| retorno parabólico | $\begin{gathered} \mathrm{L} \cdot\left[1-2 \cdot\left(\frac{\mathrm{~A} 2-\mathrm{A}}{\mathrm{~A} 2-\mathrm{A} 3}\right)^{2}\right] \\ 2 \cdot \mathrm{~L} \cdot\left(\frac{\mathrm{~A}-\mathrm{A} 3}{\mathrm{~A} 2-\mathrm{A} 3}\right)^{2} \end{gathered}$ | $\begin{aligned} & -\frac{4 \cdot L \cdot(\mathrm{~A}-\mathrm{A} 2)}{(\mathrm{A} 2-\mathrm{A} 3)^{2}} \\ & \frac{4 \cdot \mathrm{~L} \cdot(\mathrm{~A}-\mathrm{A} 3)}{(\mathrm{A} 2-\mathrm{A} 3)^{2}} \\ & \hline \end{aligned}$ | $\begin{aligned} & -\frac{4 \cdot \mathrm{~L}}{(\mathrm{~A} 2-\mathrm{A} 3)^{2}} \\ & \frac{4 \cdot \mathrm{~L}}{(\mathrm{~A} 2-\mathrm{A} 3)^{2}} \\ & \hline \end{aligned}$ | $\begin{aligned} & \mathrm{A} 2 \leq \mathrm{A}<\frac{\mathrm{A} 2+\mathrm{A} 3}{2} \\ & \frac{\mathrm{~A} 2+\mathrm{A} 3}{2} \leq \mathrm{A}<\mathrm{A} 3 \end{aligned}$ |
| retorno cúbico | $\begin{gathered} \mathrm{L} \cdot\left[1-4 \cdot\left(\frac{\mathrm{~A} 2-\mathrm{A}}{\mathrm{~A} 2-\mathrm{A} 3}\right)^{3}\right] \\ 4 \cdot \mathrm{~L} \cdot\left(\frac{\mathrm{~A}-\mathrm{A} 3}{\mathrm{~A} 2-\mathrm{A} 3}\right)^{3} \end{gathered}$ | $\begin{aligned} & \frac{12 \cdot \mathrm{~L} \cdot(\mathrm{~A}-\mathrm{A} 2)^{2}}{(\mathrm{~A} 2-\mathrm{A} 3)^{3}} \\ & \frac{12 \cdot \mathrm{~L} \cdot(\mathrm{~A}-\mathrm{A} 3)^{2}}{(\mathrm{~A} 2-\mathrm{A} 3)^{3}} \end{aligned}$ | $\begin{aligned} & \frac{24 \cdot L \cdot(A-A 2)}{(A 2-A 3)^{3}} \\ & \frac{24 \cdot L \cdot(A-A 3)}{(A 2-A 3)^{3}} \end{aligned}$ | $\begin{aligned} & \mathrm{A} 2 \leq \mathrm{A}<\frac{\mathrm{A} 2+\mathrm{A} 3}{2} \\ & \frac{\mathrm{~A} 2+\mathrm{A} 3}{2} \leq \mathrm{A}<\mathrm{A} 3 \end{aligned}$ |
| retorno senoidal | $\frac{\mathrm{L}}{2} \cdot\left[1-\cos \left[\frac{\pi \cdot(\mathrm{A}-\mathrm{A} 3)}{\mathrm{A} 2-\mathrm{A} 3}\right]\right.$ | $\frac{\pi \cdot \mathrm{L}}{2 \cdot(\mathrm{~A} 2-\mathrm{A} 3)} \cdot \sin \left[\frac{\pi \cdot(\mathrm{A}-\mathrm{A} 3)}{\mathrm{A} 2-\mathrm{A} 3}\right]$ | $\frac{\pi^{2} \cdot \mathrm{~L}}{2 \cdot(\mathrm{~A} 2-\mathrm{A} 3)^{2}} \cdot \cos \left[\frac{\pi \cdot(\mathrm{~A}-\mathrm{A} 3)}{\mathrm{A} 2-\mathrm{A} 3}\right]$ | $\mathrm{A} 2 \leq \mathrm{A}<\mathrm{A} 3$ |
| retorno cicloidal | $\frac{L}{\pi} \cdot\left[\frac{\pi \cdot(\mathrm{~A}-\mathrm{A} 3)}{\mathrm{A} 2-\mathrm{A} 3}-\frac{1}{2} \cdot \sin \left[\frac{2 \cdot \pi \cdot(\mathrm{~A}-\mathrm{A} 3)}{\mathrm{A} 2-\mathrm{A} 3}\right]\right]$ | $\frac{\mathrm{L}}{\mathrm{A} 2-\mathrm{A} 3} \cdot\left[1-\cos \left[\frac{2 \cdot \pi \cdot(\mathrm{~A}-\mathrm{A} 3)}{\mathrm{A} 2-\mathrm{A} 3}\right]\right.$ | $\frac{2 \cdot \pi \cdot \mathrm{~L}}{(\mathrm{~A} 2-\mathrm{A} 3)^{2}} \cdot \sin \left[\frac{2 \cdot \pi \cdot(\mathrm{~A}-\mathrm{A} 3)}{\mathrm{A} 2-\mathrm{A} 3}\right]$ | $\mathrm{A} 2 \leq \mathrm{A}<\mathrm{A} 3$ |

