

Prijelazna funkcija $h(t)$

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↳ step response

$$H(s) = \frac{1}{s} G(s)$$

$$g(t) = \frac{dh(t)}{dt}$$

a) prijelazna funkcija u stacionarnom stanju $h(\infty)$ (teorem o konačnoj vrijednosti)

$$h(\infty) = \lim_{t \rightarrow \infty} h(t) = \lim_{s \rightarrow 0} s \cdot H(s) = \lim_{s \rightarrow 0} s \cdot \frac{1}{s} G(s) = \lim_{s \rightarrow 0} G(s)$$

b) prijelazna f. u poč. stanju $h(0)$

$$h(0) = \lim_{t \rightarrow 0} h(t) = \lim_{s \rightarrow \infty} s H(s) = \lim_{s \rightarrow \infty} G(s)$$

c) nagib prijelazne funkcije u poč. trenutku

$$h'(0^+) = \lim_{t \rightarrow 0} \dot{h}(t) = \lim_{s \rightarrow \infty} s^2 \cdot H(s) = \lim_{s \rightarrow \infty} s^2 \cdot \frac{1}{s} \cdot G(s) = \lim_{s \rightarrow \infty} s G(s)$$

Težinska funkcija $g(t)$

↳ impulse response

$$G(s) = \frac{X(s)}{U(s)}$$

$$a) g(\infty) = \lim_{t \rightarrow \infty} g(t) = \lim_{s \rightarrow 0} s G(s)$$

$$b) g(0) = \lim_{s \rightarrow \infty} s G(s)$$

c) nagib :

$$\dot{g}(0) = \lim_{t \rightarrow 0} \dot{g}(t) = \lim_{s \rightarrow \infty} s^2 G(s)$$

Točka infleksije $\rightarrow 2. \text{ derivacija} = 0$

Vrijeme podbacara $h'(t) = 0$

$$\dot{y}(t) = 0 \rightarrow sY(s) - y(0^-)$$

$$\ddot{y}(t) = 0 \rightarrow s^2 Y(s) - s y(0^-) - \dot{y}(0^-)$$

\rightarrow nagib izlaza :

$$\dot{y}(0^+) = \lim_{t \rightarrow 0} \dot{y}(t) = \lim_{s \rightarrow \infty} s^2 Y(s)$$