

Exercício Laplace 21.10.2021

$$(d^3 y / dt^3) + 6(d^2 y / dt^2) + 11(dy/dt) = 1;$$

$$y(0) = y'(0) = y''(0) = 0$$

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$$y'''(t) + 6 y''(t) + 11 y'(t) = 1$$

$$y(0) = y'(0) = y''(0) = 0$$

$$[s^3 Y(s) - \cancel{s^2 y(0)} - \cancel{s y'(0)} - \cancel{y''(0)}] + 6 \cdot [s^2 Y(s) - \cancel{s y(0)} - \cancel{y'(0)}] + 11[s Y(s) - \cancel{y(0)}] = 1/s$$

$$s^3 Y(s) + 6 s^2 Y(s) + 11 s Y(s) = \frac{1}{s}$$

$$Y(s) (s^3 + 6 s^2 + 11 s) = \frac{1}{s}$$

$$Y(s) = \frac{1}{(s^3 + 6 s^2 + 11 s) s}$$

$$s^3 + 6 s^2 + 11 s = 0$$

$$s(s^2 + 6s + 11) = 0 \quad 1 \text{ raiz igual a zero e 2 complexas}$$

$$\frac{1}{s^3 + 6s^2 + 11s} = \frac{A}{s} + \frac{B}{s^2 + 6s + 11}$$