Symbolic Math of Python

MADT

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1 Exercises 1

Find y(t) of the following Laplace transforms for $t \geq 0$

1 $Y(s) = \dfrac{s}{s+2}$

2 $Y(s) = \dfrac{3s-5}{s^2+4s+2}$

3 $Y(s) = \dfrac{3-6e^{-2s}}{(s+2)(s+3)}$

4 $Y(s) = \dfrac{10}{s^3+2s^2+5s}$

5 $Y(s) = \dfrac{4s+4}{(s+2)(s+3)^2}$

2 Exercises 2

Solve the following differential equation using Laplace transform for $t \geq 0$ with the given initial condition

1 $4y + \dfrac{d}{dt}y(t) = 6e^{-2t}$

$y\left(0^-\right) = 3$

2 $y + \dfrac{d}{dt}y(t) = 3\cos(2t)$

$y\left(0^-\right) = 0$

3 $12y + 7\dfrac{d}{dt}y(t) + \dfrac{d^2}{dt^2}y(t) = 4$

$y\left(0^-\right) = 3$

y' $\left(0^-\right) = 0$

4 $20y + 4\frac{d}{dt}y(t) + \frac{d^2}{dt^2}y(t) = 4$

$y\left(0^-\right) = -2$

y' $\left(0^-\right) = 0$

5 $6\frac{d}{dt}y(t) + 5\frac{d^2}{dt^2}y(t) + \frac{d^3}{dt^3}y(t) = 0$

$y\left(0^-\right) = 3$

y' $\left(0^-\right) = -2$

y" $\left(0^-\right) = 7$